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Saving the Gray Iron Foundry

Steps Are Recommended to Protect the Industry from
Encroachments of Steel and Malleable Castings
and of forgings and Stampings

BY DR. RICHARD MOLDENKE

IT is an unpalatable but patent fact for the producer of gray iron castings that of late years the industry has retrogressed. The inroad of malleable and steel castings into the field of gray iron, whether this be by new foundries or newly added departments, must naturally alarm the man who for many years has patiently and laboriously built up a business. If it were merely the failure of mushroom enterprises it would not be so bad. But when well-established foundries of even national fame either have to change a more or less extensive portion of their production from gray iron to steel or go out of business it becomes desirable to find the facts, study the causes, and seek the remedy—if any can be found and made effective.

The easiest approach to facts and figures on the subject is to study the report of existing gray iron, malleable and steel foundries in the United States and Canada, as given in Penton's *Foundry List*, issued biennially. This list since 1912 has been sufficiently reliable to permit comparisons. While a mere enumeration of foundry entities does not constitute a measure of the advance or retrogression of the industry as a whole (for tonnages would have to be considered), it is a pretty safe indication of the situation, and can be regarded as the vital statistics of American foundry development. The following table gives the totals of operating foundries in North America, exclusive of Mexico, for the years indicated:

	1912	1914	1916	1918	1920	1922	1924
Gray iron foundries	4,943	5,057	4,724	4,787	4,857	4,854	4,564
Malleable iron foundries	192	214	213	268	268	274	229
Steel foundries	310	318	332	426	449	409	374

The figures are illuminating, so far as individual enterprises are involved. We may regard 1912 as the culmination of the period previous to the war and hence not affected by conditions upsetting normal judgment, such as followed 1914. The figures for 1912 can

Dr. Moldenke's Program for Checking the Retrogression of the Gray Iron Foundry

THERE is a need in the field of gray cast iron for a comprehensive undertaking, amply supported by funds and properly divided into groups, so that work can be done directly in the foundries and these be brought up to the modern level of equipment and operating methods.

If the several distinctive lines of gray iron production could get together on such a program the savings effected and new prestige attained would be very great.

Knowledge of the qualities and possibilities of cast iron, shared by maker and purchaser alike, together with a thorough introspection and resulting improvement at home, would seem to be the best means of arresting the decline of a great industry.

be assumed, therefore, as of normal development. Similarly 1924 can be regarded as a period representative of American conditions with slates wiped clean, and as normal as they are likely to be for a considerable time ahead. So that, whatever may be between the two years in question, the figures for these are fairly comparable. In 1924 there were 7.7 per cent fewer individual foundries in operation than a decade earlier. During the same 12 years malleable castings foundries had increased 19.3 per cent in number, and steel foundries 20.6 per cent, or about the same.

This decline of the gray iron foundry—if it may be so designated—as shown by the series of figures given in the table, leaves much to be read between the lines. The normal development of an industry comes about by existing plants increasing their capacity only after the demands can no longer be met with even forced production methods. This is sound enough, for the war has shown what equipment for

peak loads has led to. But this policy on the other hand opens up the way for the establishment of new enterprises, on the assumption that where five plants have all hands full, to supply the demand there is room for a sixth establishment. It is such a policy that has recently caused the makers of east iron pipe to welcome the advent of foreign competition, since it merely gives surplus requirements to foreign makers and does not encourage the building of new pipe plants by others than those now in the business, who have expanded only on a safe and sane basis.

Steady Loss of Gray Iron Foundries

The figures show that even if existing plants have increased their capacity during the 12 years in question there was need for more malleable and steel castings plants. Indeed, it becomes a question whether the gray iron foundries remaining have really increased capacity very extensively. That even the malleable

and steel castings plants had over-extended is shown by the slump in foundry units following 1922. The gray iron foundry industry lost only 6 per cent in numbers, whereas the steel castings industry lost 9 per cent, and the malleable castings industry—in spite of all the advertising done for it—fell away 16 per cent. The loss in gray iron foundries was a steady one in that there was no normal expansion commensurate with the size of the industry, even when figures rose a little from previous drops.

Again it must not be lost sight of that the increase in malleable and steel castings plants does not mean that all the foundries for gray iron which ceased to operate became a total loss to their owners. True, a gray iron foundry is very uneconomical for conversion into either a malleable or a steel plant, and hence is seldom so changed. But sometimes the gray iron foundry buildings are sold or torn down for replacement by more suitable structures for the other line of castings to be made. In fact many of the foundries embraced in the malleable steel castings expansion are simply new departments in old works.

Substitutions for Gray Iron Castings

But naturally there are reasons for the regrettable retrogression under discussion. It is patent that once the making of malleable castings was put upon a scientific basis in the early nineties of the last century, and knowledge of this became common property soon after, many castings formerly made in gray iron were found better and lighter when of malleable. Similarly, as the art of making steel castings successfully was developed out of ordinary open-hearth steel practice, enormous tonnages were captured from the gray iron foundry without need of sales effort. Indeed the malleable foundry is today fighting off the constant encroachments of steel in a losing game where steel is indicated as the proper material to use. No amount of advertising will prevent such a change in the end.

So in the above argument it will be noted that the natural law permits the malleable foundry to grow at the expense of the light gray iron castings industry, as well as the steel foundry to cut into the heavy lines of gray iron work, without hope of recourse. Added to this is the fact that a high degree of metallurgical skill is necessary in the malleable and the steel industry to produce good work; and where there is a high degree of skill in buying castings for construction purposes, castings will not be selected from the gray iron foundry if steel or malleable will do better. Since the educational advantages of modern times are such that trained engineers are now in charge almost everywhere, it has come to a race in improvement so that a pound of iron must go further. Gray iron naturally suffers. Not that gray iron castings cannot be made well and are not made well; but the legitimate field of their usefulness is being constantly narrowed by the production of higher grade results in the other lines. It is up to the foundryman to see that rock-bottom is soon reached so far as he is concerned.

Besides the natural law of selection, and the emphasis placed upon this law by technical knowledge, there is the forced stimulation through associated effort in bringing the excellencies of steel and malleable before the buying public. The trained buyer welcomes the technical information thus disseminated and put at his disposal, but nevertheless judges by actual performance—even going the manufacturer one better by stiffening his specifications steadily. He discounts the merely advertising features of the propaganda in question. The uninformed lay buyer, however, cannot naturally be so discriminating and here is just cause for irritation on the part of the gray iron foundryman. Practically the only recourse he has is to go and do likewise.

Use of Stampings and forgings

There is, in addition to the above, another cause of loss of work to the gray iron founder, and that is the use of steel for stampings and forgings. The costlier foundry labor becomes, the greater the in-

roads by this division of the manufacturing steel industry. The ease in turning out steel forgings, once the dies have been made, is perhaps the underlying thought in the development of the "long-life" mold for gray iron work. There is little difference between introducing molten metal between the closed halves of a coated iron mold and hot solid steel between closing steel dies under high pressure.

A table of pig iron tonnages for a period of years will be of interest in this connection. There is given the total tonnage of pig iron made in the United States from 1910 to 1924, and of this the portion going respectively to the gray iron and the malleable foundry. Forge iron also is given inasmuch as it enters heavily into cast iron pipe mixtures.

Pig Iron Production in the United States—Gross Tons

Year	Foundry	Malleable	Forge	Total
1910	5,260,447	843,123	564,157	27,303,567
1914	4,533,254	671,771	361,651	23,332,244
1918	5,145,260	1,117,914	393,932	39,054,644
1919	4,916,758	1,009,049	271,286	31,015,364
1920	5,957,782	1,310,951	318,048	36,925,987
1921	2,568,136	457,340	112,748	16,688,126
1922	3,976,431	1,051,495	214,210	27,219,904
1923	6,470,013	1,571,064	327,430	40,361,146
1924	5,623,124	973,158	255,961	31,405,790

Small Growth of Foundry Pig Iron Production

It is difficult to give an analysis of the above figures. Take for instance the malleable pig iron production. It is well known that a very large tonnage of this goes into the gray iron foundry because of the low phosphorus content; also for making chilled castings, as rolls and parts of grinding and pulverizing machinery. The increasing tonnages of cast iron pipe leave correspondingly reduced quantities of forge pig iron going into the puddling mills. On the whole, however, it is astonishing to see how small has been the growth of foundry as well as malleable pig iron in the last dozen years as compared with that going into steel. There seems no question that the forced expansion of the steel castings industry—now proved to be an over-expansion for some years to come—and of the stamping and forging industries has hurt the gray iron field much more than the aggressiveness of the malleable foundries. Indeed, the malleable castings situation is menaced very much by the development in small steel castings.

As an interesting sidelight on the struggle for quality production, some figures on the use of the electric furnace are given in the following: Penton's *Foundry List* has the number of electric steel foundries in 1918 as 161. By 1920 these had increased to 206; 1922 saw this figure reduced to 202, and by 1924 the reduction had gone to 191. This is still over half the total number of steel foundries. The gray iron foundry cannot show more than two dozen plants equipped with electric furnaces, and these probably mostly in an auxiliary way. The malleable foundry industry has but a few electric furnaces. All of which indicates that the best progress has been made in the steel foundry, where the greatest demand for quality is encountered. The excellent technical and administrative results obtained by an associated group of electric steel castings producers has shown what can be accomplished in eliminating waste and systematizing foundry procedure.

What of the Future?

What can the gray iron foundry do to turn the tide? The gray iron casting is too good and too cheap a product to be eliminated from the field. In every line of production today there are cogent reasons why gray iron castings should and will continue to be made. Take as an example the ordinary stove. When made with high-phosphorus iron and in very fine sand it is a thing of beauty, not matched by either the stronger malleable or the steel stove. When finally scrapped it still serves the foundryman in his mixtures. What is better than the fine, hard grain of the chilled roll for the steel mill? Cast iron pipe is far ahead of the steel article under corrosive influences. For large frames and base plates, for quiescent load applied in compression, for ease in machining, adaptability for intricate castings, general cheapness as

compared with other materials, cast iron cannot be surpassed. So it becomes a question of making special educational effort in two directions: first, that the purchasing interests be thoroughly informed on what the gray iron foundry can produce, and second, that the producing foundrymen be thoroughly informed upon and equipped for bringing out the highest type of castings.

For years associated effort has been made to broadcast information on cast iron and some research has been made along special lines, such as testing. But at best the work has been done by individuals or small groups. There is a need in the field of gray cast iron for a comprehensive undertaking, amply supported by funds and properly divided into groups, so that work can be done directly in the foundries and these be brought up to the modern level of equipment and operating methods. Great Britain, which was certainly behind us in foundry progressiveness until recently, has passed us in the formation of the British Cast Iron Research Association. But even the excellent program of work there laid out is not sufficient to cover the needs of the situation. Added to pure research and thorough publicity for the results obtained there should be a study and classification of foundries such as was attained best in another field during the

great war when Germany was in desperate straits with its coal supply. Stations were established in the centers of great consuming regions from which personal investigation emanated, tabulating the uses and abuses of fuel. Without affecting the monetary interests of the parties investigated, information was given out where required to bring poor practice and equipment up to the best standards, and thus in due time almost a third of the fuel formerly required was saved to that country.

If the several distinctive lines of gray iron production could get together on such a program the savings effected and new prestige attained would be very great. The small group of electric steel producers above mentioned has the germ of the idea, and if such a germ were planted in gray iron foundry circles and propagated by concerted action and ample endowment, the gray iron foundry would quickly come up on a basis of an equal chance with the malleable and steel publicity development. In actual plant efficiency and possibilities, it would outstrip them.

Knowledge of the qualities and possibilities of cast iron, shared by maker and purchaser alike, together with a thorough introspection and resulting improvement at home, would seem to be the best means of arresting the decline of a great industry.

Reducing Costs of Cleaning Castings

Plea for Greater Study and Better Application of Equipment
—Hydraulic Methods

BY J. H. HOPP*

REDUCING the cost of cleaning castings has usually not received the study given to other foundry operations. The paper emphasizes the need for more attention to this phase of foundry practice. It discusses in detail the factors of shop practice in general which affect the cleaning operation.

Molding sand, together with the use of a facing, is stated to be one of the factors which needs most careful attention. Proper placing of gates and risers and the composition of cores are discussed as factors which must be considered in advance of the production of the casting. The author believes that more castings are lost from the improper use of risers than from failure to use them. Even when sound reasoning and study have been expended with regard to the number of risers, and their location on a particular pattern, the casting may suffer from the lack or kind of treatment given the riser after the mold has been poured.

Cleaning department equipment and the need for analyzing types of castings in respect to the equipment used are discussed in detail, together with the question of cost. Under the heading of grinding wheels the desirability of studying the bonds of wheels is brought out.

Sand blasting and milling, as two separate operations, are discussed and compared both individually and with relation to the cost of grinding after the casting has been put through the other operation. The author pointed out that certain castings cannot be milled if the original intent of the pattern is to be retained.

Discussion

R. S. MacPherran, Allis-Chalmers Co., Milwaukee, pointed out that his company is using a hydraulic method for cleaning castings, which has resulted in great saving of time for the operation. Before castings can be cleaned by this means, however, they have to be allowed to cool sufficiently to prevent cracks on the impact of the cold water. This results, in

*Hopp-Patterson Co., Chicago. This is an abstract of a paper contributed on behalf of the Chicago Foundrymen's Club at the Syracuse Meeting of the American Foundrymen's Association.

the case of large castings, in taking about as much over-all time as in the more usual methods of cleaning, but the labor cost is greatly reduced. Hydraulic cleaning is primarily for the purpose of removing cleaning sand and at the same time shooting out the cores. The speaker referred to two specific instances, in one of which the time for the operation had been reduced from 130 hr. to 8 hr., while in the other case the cores had been shot out in 4 hr., compared with 132 hr. previously required for this purpose.

It must be remembered that this method is not a complete method, for it still leaves the fins to be chipped out. It may produce some rusting on surfaces, but this is of no moment in the final effect. The casting has to be allowed to cool enough so that the hand can almost be held on its surface. It then is subjected to water blast from several streams under a pressure of about 300 lb. per sq. in. These are controlled by the operator in such manner as to clear out all loose material as quickly as possible.

One speaker brought out the fact that, inasmuch as this sand, mixed with water, tends to clog up sewers, injunctions had been obtained in some cities where the hydraulic method was tried out. This disability of the method has to be overcome by arranging pits wherein the material can settle, after which the water is pumped out from the top, while the deposited sand is taken up by grab buckets and put to other use. Dr. Richard Moldenke suggested as a future goal that we should work along lines which would tend eventually to doing away altogether with the need for cleaning castings.

The Louisville Gas & Electric Co., Louisville, Ky., a subsidiary of the Standard Gas & Electric Co., Chicago, is preparing plans for a hydro-electric generating plant on the Ohio River near Louisville. The station will be designed for 13 units to develop an initial capacity of 108,000 hp. When completed, this station will have an ultimate output of 135,000 hp. and will cost approximately \$10,000,000. The engineering work is being carried out by the Byllesby Engineering & Management Corporation, Chicago.

Shows Need for Price Stability

President Gary Suggests Movement, with Government Aid, to Eliminate Destructive Competition—Institute Program Is of High Caliber Throughout

A MOVEMENT to stabilize business, similar to that which was undertaken by the iron and steel industry in the so-called "Gary" dinners following the panic of 1907, was suggested by Elbert H. Gary, chairman of the board, United States Steel Corporation, in an address before the American Iron and Steel Institute, of which he is president. The proposal, which was the climax of Judge Gary's remarks at a banquet which concluded the institute's semi-annual meeting at Hotel Commodore, New York, Oct. 23, was consonant with an analysis of the business needs of the industry and a survey of the most recent opinions of the United States Supreme Court interpreting the Sherman Law.

"The iron and steel business in this country is good and should be considered satisfactory," said Judge Gary in the course of his address. "But," he later added, "some of you may say that, taking into account the large investment of capital by reason of extra cost of construction and otherwise, there has not been a fair and reasonable return in profits. Well, whose fault is it? Can you blame the wealth of the country, or the lack of crops, or the climate, or the present disposition of the Government? No, it is our own fault. It is because of our desire and effort, respectively, to secure more than our fair share of trade, and, as a consequence, we have carried competition to the point of accepting unreasonably low prices for our commodities. . . . The prices of our commodities we fix, or rather, we allow purchasers to fix, simply because we are unreasonably selfish. It is because of this natural tendency some of us have thought there ought to be allowable some form of cooperation, which would be protective against imposition."

Gary Dinners Vindicated

That cooperative efforts such as were fostered by the Gary dinners were in the mind of the speaker was indicated by other significant pronouncements in his address. Among the most important was the statement in effect that the Gary dinners have been vindicated. In Judge Gary's own words on this point, "the attitude assumed by the steel industry in 1908 is substantially approved by the Supreme Court in 1925."

This conclusion followed a comparison between portions of an address delivered at a Gary dinner on Dec. 10, 1908, and excerpts from a decision of the United States Supreme Court on June 1, 1925, in a case entitled *Maple Flooring Manufacturers' Association, et al., vs. the United States of America*. Although the name of the speaker at the 1908 meeting was not mentioned, reference to *THE IRON AGE* of Dec. 17, 1908, discloses that it was none other than Judge Gary himself. The close parallels between his remarks at that time and the recent opinion of the court are striking. Among the salient points in the 1908 address was the following:

As I understand, it is not improper for competitors to meet and without reserve furnish full information and express opinions concerning the business affairs of all, provided they are not acting under an agreement, express or implied.

In the court opinion the same thought is expressed as follows:

Trade associations or combinations of persons or corporations which openly and fairly gather and disseminate information as to the cost of their product, the volume of production, the actual price which the product has brought in past transactions, stocks of merchandise on hand, approximate cost of transportation from the principal point of shipment to the points of consumption as did these defendants, and who, as they did, meet and discuss such information and statistics without, however, reaching or attempting to reach any agreement or any concerted action with respect to prices or production or restraining competition, do not thereby engage in unlawful restraint of commerce.

Stabilization of Prices Permitted

In the address this further comment was made: .

It is not wrong, even though any or all may be influenced regarding any particular business, nor even though the result may be to prevent radical and unreasonable changes in prices.

In the opinion:

The natural effect of the acquisition of wider and more scientific knowledge of business conditions, on the minds of the individuals engaged in commerce, and its consequent effect in stabilizing production and price can hardly be deemed a restraint of commerce, or, if so, it cannot, we think, be said to be an unreasonable restraint, or in any respect unlawful.

In the address:

We have been successful in securing stability as opposed to demoralization.

In the opinion:

Exchange of price quotations of market commodities tends to produce uniformity of prices in the markets of the world. Knowledge of the supplies of available merchandise tends to prevent overproduction and to avoid the economic disturbances produced by business crises resulting from overproduction.

The Law Abhors Destructive Competition

After making these comparisons Judge Gary cautioned his audience that "there is no tendency on the part of the courts or any department of Government to ignore or to modify the effect of the Sherman law when properly interpreted and applied.... Any arrangement between different interests, direct or indirect, express or implied, calculated to maintain future prices of commodities or services, conflicts with the Sherman law and will not be tolerated by the Government."

On the other hand, he emphasized the fact that "full information by one to others concerning business is permitted. The law does not compel one to compete with another if one does not desire to do so, and the law especially abhors competition which is intended to be destructive, unconscionable and dishonest."

It was at this juncture that Judge Gary made the proposal which proved a surprise to many and has arrested the attention of the entire industry. What he said is given verbatim elsewhere in this account.

Urges Wider Application of Golden Rule

The application of the Golden Rule was also urged by the speaker as a means of curing present business ills. He said, in part:

"The iron and steel industry of the United States, big as it is, cannot alone secure the general adoption of the Golden Rule in business. It can do much in this direction. Perhaps it has done considerable; but it is far from perfect, even as between its own members.

there was nothing to be gained from trying to get any business in the anteroom, finally saying, "You will be turning away business before our next meeting," a statement which was rather generally quoted as though it had been formally stated in the course of the address itself.

Great Prosperity in Sight

The scope of the main address in the evening was broad. It touched not only on the regulation of corporations, but on business prospects, local conditions, national affairs, and the international situation. In discussing the business outlook he said, "We have reason to hope and expect great prosperity."

In touching on local conditions, he pointed out the relationship between the crime wave and the general economic situation.

"When law and order are defied and property and person thereby endangered, the natural progress of business is bound to be interrupted to some extent.

Suggests Stabilizing Effort with Government Counsel

"As a suggestion for consideration by the iron and steel industry, which is large and influential, would it be advisable," asked Judge Gary, in his presidential address to the American Iron and Steel Institute, "to make another effort to stabilize the business? Suppose the Department of Justice would be willing to participate. If meetings should occasionally be held by the manufacturers for the discussion of business on the lines pursued in 1907, and a representative of the Department of Justice should be designated by the Attorney-General to attend and listen, and whenever necessary and appropriate to advise concerning the law, what would be the effect upon the steel business, and perhaps other lines? Possibly this could be accomplished."

Live, active competition is desirable; but destructive, dishonest or unfair competition is deplorable and deprecatory."

The point was stressed even more in Judge Gary's remarks when he opened the morning session of the convention. He said:

"The lack of success in our lines of business to a greater or less extent results from a lack of confidence in each other. We do not always believe what our neighbors say. We believe our neighbors are selfish in the extreme. We overlook the fact that it is just as true of ourselves. Members of the iron and steel industry, which has not always had the best reputation in business, have reached a moral and intellectual position in which it is realized that it is better from every standpoint for a man to be fair and square in business. Sad to say, we are at times negligent and careless in what we say, and seek to secure a little more business when times are dull because we think our stockholders will be better satisfied if we can make a little more money. We are blind to the fact that when seeking only a fair share, we manage to make a little more. We are on the eve of great prosperity. To the extent that prosperity increases and mills are filled and order books are large, our honesty in dealing with each other will increase proportionately."

The wave of laughter following this remark in conclusion of the informal address hastened Judge Gary to mention that it was only a practical suggestion that all should get out of the practice of trying unduly to get business from their competitors. There was then the usual confusion resulting from numbers making their way out of the room, whereupon Judge Gary, in attempting to secure quiet, mentioned jocularly that

But there must be and there is being organized, lawful defense against criminal outrages."

On the subject of national affairs he said, in part:

"Our people have been staggering under the burdens of heavy war taxes, national and local, income, inheritance and others, and high costs of living; and the action of discordant elements in Congress. These conditions have dispirited business men and to a considerable extent interfered with national progress. However, it would seem there has been a decided improvement in national conditions.... It now seems probable that the next Congress as a whole will stand high in the estimation of the people of this country and other countries. There will be more harmony, less discord."

Importance of Locarno Convention

In concluding an analysis of international affairs he said that the Locarno treaty "is the best single thing for the entire world that has happened since the armistice was signed in November, 1918."

World affairs were dealt with, also, by the three other speakers at the banquet.

Col. Francis Vernon Willey, president Federation of British Industries, outlined the problems confronting Europe in its economic reconstruction and emphasized the opportunity for the United States to take the lead in restoring international credit. In its economic position, he said, the United States is the strongest nation in the world and its responsibilities are proportionate. "The recent agreements at Locarno must encourage us all."

Dr. Peter Munch, Danish representative to the recent meeting of the Interparliamentary Union at

Washington and delegate of Denmark to the League of Nations, also stressed the importance of the Locarno convention. The bitter antagonism between Germany and France has been the most serious obstacle to the recovery of Europe. With the settlement of that question all others will be much easier of solution, he said. It will now be possible to undertake limitation of land armaments. In emphasizing the pressing need for this step he quoted a British statesman to the effect that either civilization will destroy war or war will destroy civilization.

Hon. Charles Nagel, secretary of commerce in the cabinet of President Taft, espoused the cause of individualism in commenting upon both international and national problems. Popular will for peace is far more potent than any pact that politicians may write, he said. We have been worshippers of the letter rather than the spirit. The disposition toward over-legislation is one of the great dangers of our country. There has been too much legislation based on the idea that human-

ity can be standardized, he asserted. Any effort to substitute for the will of a man to be right and do good, compulsion to regulate his conduct operates for the deterioration of the whole community. Indifference of the great masses has permitted minorities to burden the country with ill-advised and harmful statutes. The great immediate problem is how democracy shall impress itself. A solution will never come from the supervision of one race by another. We can live only in an atmosphere of toleration. "We can have no imitation Americanization. If an American is ashamed of where he comes from, I would doubt him in the hour of stress."

Nearly 1400 were present at the banquet. The other sessions were also well attended. In the opening meeting Judge Gary read letters to him from Powell Stackhouse and Joseph G. Butler, Jr., both of whom regretted their inability to be present.

Brief abstracts of the technical papers and the discussions follow.

Properties and Types of Silicon Steel

BY W. E. RUDER



W. E. RUDER, research department General Electric Co., Schenectady, N. Y., was born Dec. 22, 1886, at Stockdale, Pa. He was graduated in 1903 from the State Normal School at California, Pa., and in 1907 from the Pennsylvania State College in electrical engineering. He entered the research laboratories of the General Electric Co. in the same year and for the last 10 years has specialized in magnetic materials and ferrous metallurgy. He has been awarded numerous patents on improvements in magnetic materials and has contributed many papers on metallurgical subjects to technical societies. He is a member of the National Research Council committee on fatigue of metals, welding, manganese conservation, etc. For the last five years he has been a research metallurgist for the General Electric Co. at Schenectady and a consulting metallurgist for the transformer department of the same company at Pittsfield, Mass.

AS far back as 1885 Hopkinson studied the magnetic and electrical properties of silicon alloys containing up to 3.4 per cent silicon, and in 1896 Parshall discussed the effect of 1 per cent silicon upon the magnetic properties of steel, but no real interest was aroused in silicon steels until Hadfield, who in 1889 had published the results of his more complete investigation of the mechanical properties of a series of silicon alloys, published in 1900 with Barrett and Brown the results of tests on magnetic properties. While these did not show values any better than had been obtained on good unalloyed materials, the improvement over the basic materials was promising and this, combined with the high electrical resistivity, was quickly recognized as being a desirable combination of properties for a core material for electrical apparatus.

In the United States the commercial production of sheets was also quickly established and one of the leading electrical companies made its first silicon steel core transformer in 1904 and by 1905 the new core material was in regular production. Since the original work by Hadfield, a great deal of detailed study of the magnetic and mechanical properties of iron-silicon alloys has been carried out.

[The author here discusses the constitution and mechanical properties of silicon steel.]

Magnetic Uses

By far the greatest economic value of silicon steel has been in its use as a core material for electrical ap-

paratus, particularly in transformers. Twenty-five years ago the best material available had a loss of over 1½ watts per lb. at 10,000 B and 60 cycles, and was very unstable. When freshly annealed it might have such a value, but if tested after a year's service this value was frequently found to have doubled. With such limitations, the progress made by the electrical industry today would have been impossible. Many attempts have been made to estimate the value of silicon steel in terms of savings in power, but anything like an accurate estimate is impossible.

If we consider only the transformers made in the United States, and assume that only those made during the last 10 years are in service now, the saving in watt loss alone for 1925 due to the use of silicon steel comes to \$15,000,000 per year, which yearly saving is being added to, at the present rate of transformer production, to the amount of approximately \$3,000,000 per year. These figures do not take into consideration the large saving in material and construction expense over that required to produce the same capacity in transformers with non-silicon cores.

Transformers of over 50,000 kva. capacity are now being built with silicon steel cores, but it is doubtful if machines of half this capacity would be practical without silicon steel, because of their bulk and weight.

While the greatest usefulness of silicon steel has been in the construction of transformers, the last decade has witnessed a rapid growth in its use for motors and generators, so that the production of "elec-

trical sheets," as they are now generally termed, has taken an important place in the steel business of the country.

[Mr. Ruder then treats fully of the magnetic properties of this steel, followed by a discussion of the effect of certain mechanical operations on the sheets and of testing.]

The rapid increase in the growth of the electrical industry and the prospects for its future development, together with the increasing necessity for conservation of energy, all presage a large increase in the use of silicon sheets, for so far, although diligent search has been made, no substitute has been found. That the steel industry is aware of this is evidenced by the increase in the number of producers. Just as electricity has become indispensable to our present-day civilization, so silicon steel has become indispensable to the electrical industry.

Discussion

Dr. John A. Mathews, Crucible Steel Co. of America, New York, in discussing Mr. Ruder's paper said that it was a clear, concise presentation of the metallurgical and magnetic properties of silicon alloy steel. That the author has modestly refrained from any direct mention of his own contributions to the subject was evident. His studies of silicon steel have led to valuable, practical results and "we have been listening to an authority on this subject."

"Under the heading, 'Mechanical Properties' the author makes a brief reference to the usual high static properties conferred on medium carbon steels by silicon. So far as elastic limits and ultimate strength are con-

cerned, they are not exceeded by the more unusual and expensive elements and, considering their high elastic limit and hardness, they show very good ductility. The speaker has seen a 0.50 per cent carbon silicon-manganese steel treated to give 225,000 lb. per sq. in. elastic limit and 450 Brinnell hardness, which showed 10 per cent elongation in 2 in. and 45 per cent reduction of area.

"Mr. Ruder states that these steels are limited in their use by their low impact strength. This seems to be a rather prevalent idea. It is my experience that, when incomplete hardening occurs, the physical properties are not what they should be. Under-heating, as well as over-heating, is a frequent cause of erratic results. I find very few figures available on the shock resistance of silico-manganese steels, but some years ago we made an investigation of several types of spring steel as influenced by low temperatures. Silico-manganese steel showed 3 to 8 times as much resistance to shock as a good carbon spring steel containing 1 per cent carbon, but was somewhat lower than chrome-vanadium spring steel, though by no means would we consider it a brittle steel. The carbon steel was the only one in our series which seemed to be affected by the low temperature. A special type of silicon spring steel, containing between 3 and 3.50 per cent silicon, has been found particularly suitable for recoil springs for big guns which would not be the case if the steel were in any way subject to shock brittleness.

"The writer does not like to see a good steel given a bad name and welcomes this opportunity to clear up the misapprehension that is somewhat widespread in regard to silicon engineering structural steels."

Alloy Steel from Electric Furnaces

BY F. E. CLARK*

ELECTRIC steel was introduced to this country in a commercial way in the year 1906, and its progress from that time up to the period of the World War was indeed very slow, as the country's demands for high grade steel products were being pretty well taken care of by the open-hearth and crucible processes.

As is well known, the World War created a demand for electric steel, as specifications for the various ordnance products required by our Army and Navy were in many instances too rigid to be readily met by steels of other processes. The failure of crucibles at that time likewise had considerable influence, especially in the tool steel field, and, accordingly, the industry was given no little impetus, in fact perhaps a bit too much.

Dr. John A. Mathews, one of our real pioneers, years ago ventured the prediction that a period of reaction and dissatisfaction with electric furnace products would follow their rapid introduction, and the wisdom of this statement has been since amply justified.

It might, however, be well to recall a similar period in the introduction of the basic open-hearth, and all in all, in spite of a national post-war slump, the electric steel industry today appears to be on a commercially sound basis and its future, in spite of all possible opposition, looks very bright.

An attempt is made in this paper to justify the existence in a commercial sense of the electric furnace by a simple presentation of its advantages, together with a brief treatise on the general methods of steel making procedure which are in use throughout the country today.

It would seem that a theoretically ideal unit for the production of the highest grades of steel would offer the following advantages or features: Efficient melting; a means for most thorough deoxidation; a means for the removal of phosphorus and sulphur; no loss of alloys, temperature attainability and control; absolute degasification either in the presence of silicon or without; accurate control of analysis; flexibility that will

permit the making of any type of steel; simplicity of design and operation, and commercial practicability.

No unit in existence today completely fits these specifications, but the electric arc type furnace comes closer to filling the bill than anything available at this time. Three-phase, 3-arc type furnaces are naturally most suitable and their practicability has been well proved by some 19 years of service in this country.

Acid and basic methods have been adapted to suit requirements, but with few exceptions the acid hearth has been used in the carbon steel casting field, whereas the basic process has for the most part been confined to the making of ingots and manganese steel castings.

Most electric steel is made from charges of cold scrap, this method having proved cheaper in the average plant, although the so-called duplex process can be efficiently operated where a supply of cheap hot metal is at all times available. There has been unlimited discussion as to the relative merits of cold scrap and duplex methods particularly in regard to quality of product, but it would seem sufficient to state that, with both handled properly, there is really no difference in quality.

[The author then discusses the basic and the acid electric processes.]

Although the electric furnace is now on a very firm basis in the industrial world, it has not taken the place it justly deserves for a number of reasons. Early troubles built up considerable prejudice which has not entirely disappeared. Some of the early installations made in open-hearth plants met with failure because of the attempted application of open-hearth steel making methods. Installations made in plants operating crucible furnaces invariably met with immediate success, perhaps because of the fact that the crucible man had first in mind the production of a quality product.

It is a fact that today the quality of electric steel is on a higher plane than ever before. One possible application of the electric furnace to the so-called tonnage products is in the making of rails. As far back as 1912, microscopic examination of hundreds of speci-

*Sales engineer Republic Carbon Co., Niagara Falls, N. Y.

mens indicated a marked superiority of the electric rail to that of the open-hearth process, it being freer

from dirt, slag inclusions and segregates, all of which are characteristic of high-quality electric steel.

Recent Developments in Stainless Steel

BY DONALD G. CLARK



DONALD G. CLARK, eastern manager Firth-Sterling Steel Co., New York, was born in South Bend, Ind., in 1884. After being graduated from a technical preparatory school in 1903 he was employed by Edward S. Jackman, western agent of the Firth-Sterling Steel Co., Chicago, later becoming a partner. In 1910 he was made a resident partner at Pittsburgh. While in France on war work he was appointed to his present position, which he assumed in 1919. On the technical side, in charge of the company's experimental heat treatment plants, he was among the first to develop the use of salt baths for treating high-speed steel. He assisted in starting the Chicago heat treating organization, which later merged with the Detroit society and became the present organization, the American Society for Steel Treating. His recent technical work has been in connection with the introduction of stainless steel.

YOUR committee in selecting stainless steel for discussion at this meeting very appropriately marked the tenth anniversary of Harry Brearley's application for an American patent on what he described as "an alloy of steel which is practically untarnishable when hardened." About five years ago Elwood Haynes read to you a paper on "Stainless Steel" which was ably discussed by John L. Cox and Dr. John A. Mathews and covered the development to that time. Progress during the past five years has been so rapid that our leading technical societies have been devoting whole periods at their annual meetings to symposia on corrosion-resistant steels and alloys.

"Stainless" is an excellent name for a non-rusting, corrosion-resisting and heat-resisting steel. Commercially the name has come to mean that group of steels which have a high chromium content, generally from 8 to 25 per cent chromium, and this paper will be limited to those steels wherein chromium is the predominant alloy.

[The author gives a résumé of the historical phase and devotes several pages to the patent situation, followed by a brief discussion of processes.]

Types of Stainless Steel

The original composition selected as typical, namely, 13 per cent chrome and 0.30 per cent carbon, is still the standard type for cutlery, dies, machine parts and other purposes where the maximum resistivity, hardness and resiliency are required. Various modifications have been made to improve certain properties or overcome certain limitations of this standard type. While the technical societies which are endeavoring to standardize steels and nomenclature have decided that the time has not yet arrived to classify corrosion-resisting alloys, I believe for the purpose of this paper those which are included under the name stainless steel may be divided in a broad way into the following types:

- (a) Standard Cutlery Type.
- (b) Hard Cutlery Type.
- (c) High Carbon Type.
- (d) Soft Steel Type.
- (e) Stainless Iron Type.
- (f) Valve Type.
- (g) Nickel Type.
- (h) Copper Type.

[These various types are discussed in the order mentioned. The first is treated in detail covering properties, resistance to heat and heat treatment.]

Stainless Iron Type

Composition. Owing to the density and hardness of stainless steel of the original type, efforts were made

at an early date to modify it so that it would not require heat treatment and so that it could be more readily used as raw material in the manufacture of forged, stamped, pressed and machined articles for those purposes in industry, commerce and personal use where extreme strength is not required but resistance to corrosion is desirable.

The development of this type was retarded because of the difficulty in introducing chromium in the steel and maintaining a low carbon, but improvements in methods have made possible the manufacture of a composition containing from 10 to 19 per cent chromium and having a carbon content of 0.12 per cent or less. This material is soft, malleable, can be cold worked without great difficulty, and while much stronger it resembles wrought iron in many ways. Therefore, in selecting a name for this type it has been called "Stainless Iron," although it is in reality an extremely low carbon form of steel, since it is manufactured by melting in electric furnaces. It has almost the same resistance to corrosion as heat treated stainless steel and, while heat treatment is not necessary to produce stainlessness, the physical properties of the iron may be greatly improved by heat treatment.

For turbine blades the stainless iron type, carefully heat treated, has proved superior to stainless steel and it is possible to procure bar steel of the stainless iron type, having guaranteed physical properties which meet the Government's requirements indicated in the following table:

Physical Properties of Stainless Iron for Turbine Blades

Elastic limit.....	Over 60,000 lb. per sq. in.
Yield point.....	Over 80,000 lb. per sq. in.
Tensile strength.....	Over 100,000 lb. per sq. in.
Elongation	Over 20 per cent.
Reduction of area.....	About 65 per cent.
Brinell	About 230 BN
Izod Impact.....	Over 50 ft. lb.
Machining properties.....	Good

An interesting sidelight on the peculiarities of stainless iron is illustrated in the difference between proportional limit and yield point on material for turbine blades. The nickel steel which is used in high-speed turbines has a proportional limit and yield point which are almost identical, but when stainless iron was tested, using the extensometer method, it was discovered to have a curve with the proportional limit far below the yield point.

The oldest installations have now been in operation for several years and, while only a few turbines have been equipped with stainless iron in this country, various types of stainless steel have been extensively used in England and on the continent of Europe.

Cold-rolled stainless iron is commercially rolled as thin as 0.020 in. and experimentally to 0.007 in. It has not been made as soft as ordinary cold-rolled strip steel, but is sufficiently soft in the bright finished condition to be blanked or stamped into articles where deep drawing or sharp bends are not required. American cold rolling mills have made rapid progress in the past two years in improving the workability of stainless strips and it is not unreasonable to suppose that they will shortly be available in a condition where they can be worked the same as ordinary strips and sheets.

Stainless wire of the iron type is now being drawn and used for parts of scientific instruments and various wire articles where resistance to corrosion coupled with strength in excess of that of non-ferrous metals is desired. As the production of wire is perfected and cheapened it will no doubt come into use for all sorts of screens and similar purposes.

Stainless tubes, in sizes from the wire used in hypodermic needles to flues, have been made, but high cost has delayed this phase of the development.

Stainless iron sheets for structural purposes and common uses, such as roofing, ship plates and pressed steel articles have developed rapidly during the past five years. Roofs have been covered with it. The Navy Department has been making extensive tests; car companies are experimenting with it and efforts are being made to develop a material which, although not sufficiently resistant to remain bright and stainless, is resistant enough to withstand the progressive rusting or corrosive action of rain, fresh water and salt water, and atmospheres containing fumes and gases common to manufacturing centers. It is, of course, a misnomer to describe such a material as stainless iron or rustless iron and it will no doubt appear under trade names to distinguish it from the rust-resisting wrought irons and irons of unusual purity which are also rust-resisting to a marked degree. In this type of stainless iron the material will probably discolor and after assuming a rusty appearance due to a thin film of colored oxide, it will be more resistant to corrosion than any steel or iron available, excepting the higher grade of stainless steel.

A better form of stainless iron sheets, having a pickled and ground surface which stays bright, is being used for kitchen table tops, counter tops, cooking utensils, restaurant fittings; and for those purposes in the hardware line where nickel-plated, enameled or tinned

iron, aluminum and copper have been preferred for a bright clean surface.

Stainless Iron Forgings. Since stainless iron is malleable and is easily forged it is used in this form for parts of automobiles, agricultural implements, sporting goods, parts of conveying machinery, marine fittings, mining machinery, ornamental iron work, etc.

Stainless iron castings are made commercially in England, but this field is practically untouched in this country.

Conclusion

In concluding this brief survey of the development during the past five years, one might say that it has been a period of exploration of the alloy field for new combinations. The types we have discussed are one result of this exploration, but it is noteworthy that nothing new has been found which equals the original stainless steel for a balance of stainlessness and strength for general use. Heat affects it less than most other metals. Its resistance to fatigue and its strength are remarkable, and in contact with hundreds of solutions and gases its value and limitations are well defined.

While the total production of stainless steel measured in terms of steel mill output is still small, it is growing at a steadily increasing pace. The way to give steel inherent permanence has been pointed out and we may safely predict that the next decade will witness a phenomenal extension in the use of all types of stainless steel which has aptly been called the metal of endless possibilities.

Discussion

T. H. Nelson, Philadelphia, gave a brief synopsis of a somewhat lengthy written discussion of Mr. Clark's paper. Having watched the growth of stainless steel since its birth, Mr. Nelson felt that the author's paper left a wrong impression and that many of its statements were similar to the phrases of the super-salesman. He did not agree that, after several years of development, there was nothing better than the original material of Brearley. Many new alloys have been developed. Stainless steel, in Mr. Nelson's opinion, is restricted as to its use as are tool steels. He asserted that he knew of several American steels of high chromium content which can be rolled quite easily. He agreed with the author that the patent situation is unfortunate and that it should be cleared up.

Low Temperature Distillation of Coal

BY MARVIN W. DITTO

MARVIN W. DITTO, general manager Socony Burner Corporation, New York, was born Oct. 3, 1886, in Montana, and educated at the University of Michigan. Beginning in the copper mines and smelters of Montana, after several years of extensive experience in mining, metallurgy and engineering work in various Western States, he took charge of the technical work and development which resulted in the practical use of Illinois coal for metallurgical purposes in blast furnaces. He built the coke oven and blast furnace plant at Granite City, which is part of the operation of the steel plant of the National Enameling & Stamping Co. Much of his time has been devoted in recent years to the distillation of coal and the production of its by-products in connection with consulting practice. Mr. Ditto also has supervision of the research work in connection with the use of petroleum oil products in industrial furnaces and heat control problems that are being introduced and used by one of the subsidiaries of the Standard Oil Co.



THE primary object of the low temperature distillation of coal is to secure the liquid and gaseous hydrocarbons in their natural form. Distillation must take place below 1300 deg. Fahr., compared to high temperature carbonization at temperatures above 2000

deg. Fahr., if one is to get the maximum yield. The principal end-product is primarily tar oils, just as coke is the primary product of by-product coke ovens.

The yields per ton of coal for low temperature distillation, adhering strictly to the method and disre-

garding possible modifications, are approximately as follows, the amount varying with the coal used:

Semi-coke	1,300 to 1,400 lb.
Tar oils	3 to 30 gal.
Ammonia sulphate	13 to 20 lb.
Gas.....	3000 to 5000 cu. ft. (700 to 800 B.t.u.)

Low temperature coke is generally of a soft, thin-celled structure and easily broken. The tar oils are made up of different series of hydrocarbon compounds from those obtained by high temperature methods.

From a general survey of the question there now seem to be three definite industrial fields where the process would be of use:

First, to the producer of bituminous coal who could work up part of his coal into more valuable by-products.

Second, to the gas man who is producing fuel gas.

Third, to public utility power generation.

The question whether a whole or a part of the process would be of interest to the steel industry depends upon the method used and the local problem to which the process is to be applied. A review of the work done up to the present time and the trend of present development indicate that it is likely to be more interesting to the coal producer and the gas industry than it is to the iron and steel industry.

Active development work started about 1906 and experiments since that time indicate that there are three general methods that are applicable. Assuming that it is a method of devolatilizing coal at temperatures below 1300 deg. Fahr. in closed retorts of suitable structure to carry on distillation in the absence of oxidizing gases, there are several methods that may be

classified according to the application that is to be made of the result. These are:

First.—The low temperature distillation of the coal, where gas of high calorific value would be recovered, together with a good yield of low temperature coke; its by-products being high yields of tar oils and some ammonia.

Second.—The low temperature distillation of the coal and the gasification of the resultant coke to be mixed with the gases resulting from the coal distillation with only oil and ammonia as the by-products.

Third.—The complete gasification of all of the products, that is, the mixture of the gas from the primary distillation with the blue gas or producer gas made from the resultant coke, and the enrichment of these combined gases by adding to them part of the oil that has been recovered from the first step by converting it into gas.

[The author devotes a large part of the 26 printed pages to describing various illustrations of the foregoing methods.]

It must not be supposed that low temperature distillation of coal is a panacea for all fuel problems as we are sometimes led to believe. The only thing we are certain of is that it will be of great practical value to the whole fuel industry if it can be worked out on a commercial basis. It is not our purpose to prophesy what the future may bring but, as a practical suggestion for those who wish to apply these methods, it will be well to keep in mind the various channels of development leading from other points into this subject and interpreting their influence upon its possible applications.

Research in Liquid Fuel Economy

BY MAX SKLOVSKY



MAX SKLOVSKY, chief engineer Deere & Co., Moline, Ill., was born in Chicago. He received the degree of B.S. in electrical engineering and the degree of M.E. from the Armour Institute of Technology. From 1901 to 1911 he was engaged in various professional connections in construction engineering, assuming his present position in 1911. He has devoted much time to special research in fuel, carried on for a number of years by investigations in the United States and Europe and also by experimental research. He has also specialized in foundry engineering and foundry production. He has made numerous contributions to professional and trade journals.

THIS discussion is limited to the application of liquid fuel, particularly fuel oil, to metallurgical operations in industrial production furnaces. For such purposes liquid fuel has proven so advantageous that interest has centered, it seems, both on the costs and on the availability of supply. The need for better economy is too obvious to require discussion at this time. It is therefore upon the manner of obtaining such better economy that this discussion hinges.

The research described in this paper began in 1912 at a time when it was recognized that the use of petroleum products was increasing at such a rapid rate that the question of supply attracted wide attention. Interest in research for the more economical use for fuel oil was stimulated by the radical increase in price which took place during that year. In searching for a substitute fuel it was soon discovered that it would be a serious detriment to production and production costs to substitute solid fuel, such as coal or coke, and it was also found that the price of gaseous substitute fuels was prohibitive in most cases by reason of the installation of gas-making apparatus.

This investigation has proved that the advantages of liquid fuels are so great, both as to production as well as labor costs, that the cost of fuel is a relatively minor item, that in place of substituting another fuel it would prove advantageous to continue the use of fuel oil, and that active effort should be made in the direction of more economical use of such fuel in order to reduce the cost of the fuel as well as to conserve the supply.

Investigation of the various types of furnaces and their combustion in general use at the time indicated a very wide fluctuation in the economy of such furnaces. A total of 251 furnaces were checked up and these are classed in the six groups with economy results as follows:

	Per Cent
Box type	11.6
Rotative type	9.65
Continuous thoroughfare type.....	13.8
Continuous type, another group.....	17.5
Welding furnaces	8.9
Open type	1.2
Average for 251 furnaces.....	9.2

[The author of this paper, which covers 19 printed pages, then discusses the influence of temperature, the factors of temperature, control of excess air, effect of gasification, and furnace construction.]

Better fuel economy is obtainable (as indicated in the foregoing discussions) by higher furnace temperatures and by controlling the ratio of air to fuel. Other items of economy, as indicated above, consist in air recuperation and in preheating of the stock in a preliminary operation by utilizing the exhaust or spent gases emanating from the combustion chamber. The first two items deal with efficiency in combustion and the latter two deal with efficiency of utilization of the heat of combustion.

Other means also exist which permit better economy in the using of liquid fuel. These are influenced by the furnace construction. Among these is the furnace size. The type of furnace also has a material bearing

on the economical use of fuel. The best results are obtained from furnaces that are specialized and limited to a few or a single kind of work. A factor affecting fuel economy is that of continuity of operation. The initial building up of temperatures takes an appreciable period of time and consumes fuel. A very important factor in fuel economy, aside from construction or selection of furnaces, is that of attention to the furnace.

As may be gathered from the foregoing discussion, three distinct classes of effort may be applied, for obtaining better fuel economy:

- 1.—By proper combustion efforts.
- 2.—By better furnace adaptation and construction.
- 3.—By better attention to the furnace.

The goal of obtaining an average of 15 per cent efficiency on the whole is worth while and within practical attainment. All that is necessary is to apply intelligent effort.

Symposium on Wrought Iron Problems

FOUR papers read at the afternoon session, which was presided over by E. A. S. Clarke, secretary of the institute, were devoted to the problems of wrought iron. The first paper, "Manufacture and Use of Wrought Iron," by H. E. Smith, engineer of tests New York Central Lines, New York, covered the problem from the point of view of one of the large users of the product. The second paper, "Ely Process of Mechanical Puddling for the Production of Wrought Iron," by Frederick H. Dechant, consulting engineer, Reading, Pa., was devoted to one type of equipment and the process connected with it for producing wrought iron mechanically. The third paper, "Roe Puddling Machine," by James P. Roe, general superintendent Reading Iron Co., Reading, Pa., was devoted to another type of equipment and method of operation in producing wrought iron mechanically. The fourth paper, "Problem of Wrought Iron Manufacture and a New Process for Its Production," by James Aston, metallurgist A. M. Byers Co., Pittsburgh, was devoted to a process for the production of wrought iron by synthetic means, making use of existing equipment.

After the reading of the four papers, they were discussed as a group by J. E. Fletcher, Birmingham, England, consultant to the British Cast Iron Research Association and the Wrought Iron Research Association, and by Henry D. Hibbard, consulting metallurgical engineer, Plainfield, N. J.

Mr. Smith pointed out that the usual statement, that wrought iron today is not so good as the product of years ago, is incorrect. He cited tests of samples of the iron taken from dismantled buildings 50 years old in support of this statement. The old iron would have been rejected under present specifications.

Pointing out the large place which wrought iron holds, by reference to the numerous uses made of it, he showed some of the difficulties which have been encountered in attempting to replace wrought iron by

means of soft steel. The relatively greater resistance of wrought iron to corrosion was touched upon. He ended by pointing out the growing difficulty of securing puddlers and the fact that, "to make the largest sizes of present-day finished product, there is desired a larger mass of iron than hand puddlers can manipulate."

Ely Process of Mechanical Puddling

Mr. Dechant described a furnace of square section mounted on carrier rings which permit its oscillation at will. The sequence of operations is the same as in the hand-puddling process. Iron turnings and ferric oxide in small pieces are used to make a solid wear-resisting bottom $\frac{1}{2}$ in. thick. Roll scale and cinder are partly melted before the charge of molten pig iron (about 800 lb.) is poured in through the door. After the boil, when the metal has fully "come to nature," the furnace is rotated to form the mass into a ball which, when complete, is discharged by rotating the furnace and opening the door.

"Because of the size of ball produced, the Ely is a low-cost furnace to install; the handling and semi-finishing machinery also is low in first cost. The structural design makes it easy to proportion the furnace to the class of work for the finishing mills. The skilled labor element is relatively low, compared with the hand process."

A special squeezer for handling the 800-lb. puddled ball was designed for removal of the excess slag and for shaping the ball quickly to a uniform cross-section before it enters the first pass of the muck rolls. This paper, as well as the others, laid stress on the necessity for obtaining high-class material at a much lower cost than the hand-puddling method permits.

Roe Puddling Machine

Mr. Roe described a machine much larger than the preceding, the furnace being rectangular, 12 ft. wide

H. E. SMITH, engineer of tests New York Central Lines, Grand Central Terminal, New York, was born in Neponset, Ill. After graduation from the high school at Marshalltown, Iowa, he completed the regular course in chemistry at the Massachusetts Institute of Technology. His first position was assistant chemist for the Chicago, Milwaukee & St. Paul Railway, later becoming chief chemist. In 1902 he entered upon the duties of chemist and engineer of tests of the Lake Shore & Michigan Southern Railroad. When this was consolidated with the New York Central Railroad he was appointed engineer of tests of the resulting combination. In 1918 he became assistant engineer in the inspection and test section of the United States Railroad Administration, in charge of the inspection of car and locomotive material. He became engineer of materials of the New York Central Lines in 1920, devoting his attention chiefly to work on track material. Since 1922 he has held his present position in charge of the testing laboratories and the mill inspection of car, locomotive and miscellaneous material.





F. H. DECHANT, of William H. Dechant & Sons, consulting engineers, Reading, Pa., was born in Reading, Aug. 31, 1887, and was graduated from the University of Pennsylvania, Philadelphia, as a civil engineer in 1910. After an earlier connection with his present company from 1910 to 1917, he became a lieutenant in the Bureau of Yards and Docks of the United States Navy from 1917 to 1919, resuming his connection with William H. Dechant & Sons in 1919. Some of the principal undertakings with which he has been connected have been consulting and active engineering work for the Reading Steel Casting Co., the American Chain Co. and the American Cable Co. and subsidiaries. He has recently been in charge of engineering on the design of equipment and production of wire for the Delaware River bridge at Philadelphia. He is a member of various engineering societies, such as the A.S.C.E., the A.S.M.E., and the A.S.M. and M.E.

and 24 ft. long, supported by hollow trunnions in the same manner as the usual support of the Bessemer converter. Oscillation through an angle of 120 deg. is possible. Dependence is placed upon a hot bottom, only one-half of which is covered by the bath, the remainder being subjected to the heat from the fuel. Thorough agitation is regarded as of vital importance, this machine having the ability to agitate the whole bath more than is possible by human power.

An analogy was traced through the 60-min. period of making the heat with the reactions and operations of hand puddling. The weight of charge is 1200 lb. and five heats constitute a 12-hr. turn. This furnace has averaged recently 1000 tons per furnace per month, equivalent to the product of ten ordinary double puddling furnaces. Thus the productive effort of a skilled puddler is increased 20-fold.

Aston Process for Making Wrought Iron

Mr. Aston's process "produces wrought iron synthetically in several independent but interlocked steps. The base metal may be produced in Bessemer, open-hearth or electric furnaces with usual charges, available labor and standard practices. The slag may be melted easily in standard types of furnaces, a cupola having been found satisfactory. Any desired composition may be secured from available raw materials—iron ore, roll scale and sand."

"Disintegration of the metal, or 'shotting,' is the keystone of the process. Fused slag (2100 deg. Fahr.) is a chilling agent for fused iron (2730 deg.). Molten iron, poured into a bath of slag, is almost instantly solidified, with a gas liberation of such force that the metal is comminuted into particles. High specific gravity causes these particles to settle to the bottom of the slag bath in a spongy, porous mass similar to a well-worked puddle ball. The slag permeates all the

interstices of the metallic mass. Excess slag may be poured or drained off and the mass compacted into a solid bloom in a squeezer or press. Roughly, three volumes of slag to one of metal will accomplish the desired end.

"About 850 heats have been made, the blooms weighing about 800 lb., but varying from 300 to 1000 lb. The material produced has satisfied exacting specifications for high-grade wrought iron and considerable amounts have been rolled to skelp or plate without repiling and then made into pipe of normal characteristics.

"Base metal and slag are separately controllable and variable. There are prospects of alloy base metals or of special types of slag not possible with hand methods or usual mechanical puddling methods. There is flexibility in selection of charge and operation, conforming to the general features of steel making. Skilled and general labor requirements are those of the steel industry, rather than of the puddler. Wrought iron and steel not only may be made in the same plant, but even from portions of the same open-hearth or other heat of metal."

Discussion

Mr. Fletcher spoke of the demand for wrought iron in England, for pipes, small bars and forgings subject to shock. Resistance to corrosion is another requirement demanding this material. In this connection he pointed out specifically that the railroad cars for carrying fish from the coastal regions of England to the consuming cities in the interior form a growing demand for this material. It has been found that the life of such cars, when made of wrought iron, is three to four times that given by mild steel.

Economic considerations were stressed by the speaker as the final answer in connection with the use

JAMES P. ROE, general superintendent Reading Iron Co., Reading, Pa., was born in Maesteg, Wales, in May, 1860. He served his time as chemical engineer from 1877 to 1882 at the Consett Iron Works, Consett, England, and was foreman of the open-hearth plant early in 1883, leaving Consett in November of that year. In December, 1883, he became assistant general engineer of the Pottstown Iron Co., Pottstown, Pa., and general superintendent in 1888. Resigning in 1890 he took a position with the Glasgow Iron Co., Pottstown, Pa., becoming general superintendent in 1894. Giving up his connection with this company in 1920 he assumed the position which he now holds.



JAMES ASTON, chief metallurgist A. M. Byers Co., Pittsburgh, is a graduate of the University of Wisconsin, with degrees in electrical and chemical engineering. Several years after graduation were spent in foundries and steel works, and three years were devoted to the investigation of electrolytic iron alloys under a grant of the Carnegie Institution of Washington. About 10 years have been devoted to metallurgical instruction at the Universities of Wisconsin and Cincinnati and to consulting work in ferrous metallurgy. He came to Pittsburgh in 1914 as metallurgical engineer for the U. S. Bureau of Mines, dealing chiefly with corrosion problems. He assumed his present position in 1916.



of any of these mechanical puddling processes. He had been "agreeably surprised, in observing the work of Mr. Roe's furnace, to see the beautiful way in which these large masses of iron were being produced." He still had doubt, however, as to the economic features.

Many years ago the British Wrought Iron Research Association studied mechanical puddling of wrought iron and operated it successfully. This was about the time that open-hearth steel came into prominence. The low cost of the latter material and its apparent possibilities caused all the "big men to put all their eggs into that one basket." A research furnace now in use in England has been made as a combination of the Roe and Ely types. It will revolve and turn and twist to such effect that Sir William Ellis called it "the nearest approach to sea-sickness he had ever seen."

In Germany many years ago the speaker had seen synthetic wrought iron produced along the lines de-

scribed by Mr. Aston. He saw molten pig iron poured into molten slag and the instantaneous reaction which resulted. He felt at that time that there was a germ of something very important in this method. At the same time, he could not banish the thought that possibly this method might follow the history of the fluid compression of steel—a method long used in England—in being found more expensive to operate than the conditions warranted.

Henry D. Hibbard referred to the fact that, 25 years ago, in the early days of the Roe development, he himself had seriously studied the reaction between melted iron and melted iron oxide and obtained a patent on the process. He said with a smile that he still holds this patent. He referred to the statement by the British Institute, many years ago, that any machine which could puddle would make better iron than hand-puddled iron.

WELDING OF BUILDINGS

Large Saving in Shop Labor Cost—Heavy Safety Factor May Be Lowered

Electric arc welding was used as a substitute for riveting in a 100 x 150-ft. two-story and basement building just erected by the Morgan Engineering Co., Alliance, Ohio, for the Peerless Auto Sales Co., Canton, Ohio. An illustrated talk on welding structural steel based on the work in the erection of this building, and covering many of the welding details, was given before the Cleveland section of the American Welding Society, Oct. 20, by R. A. Storm, superintendent of the structural steel department of the Morgan company.

As the building was not designed for welding, standard structural steel members were used. A factor of safety of seven or eight was used, to overcome prejudice against welded buildings. Mr. Storm said that there was a saving of 23 per cent in shop labor on this building and this could probably be reduced further by means of devices for assembling material quickly. There was 1268 ft. of shop welding. In the field 780 welds were made, requiring 120 hr. of time by one welder. The welding in the field was done much cheaper than the work could have been done by riveting. The welding was done by a Lincoln Electric Co. direct-current machine. Shear tests showed the welded joints stronger than riveted joints. Tests also showed that painting reduced the strength of the weld.

Mr. Storm explained that the company got into the welding work by the adoption of the welding process in rebuilding 600 locomotives, welding being used in the locomotive frames and fire-box. In the discussion, a coke pusher was referred to as an example of severe service to which welding work has been subjected. The pusher, 70 ft. long, required 40 welds and the welding was done without warping of the steel.

The Morgan company, Mr. Storm said, is now building a 245-ft. crane runway designed for welding, on which all the joints will be welded except the roof trusses. A continuous weld will be made on the crane runway girders, 34 ft. in length. The rail will not be welded, as this is a field job.

Mr. Storm urged caution in the use of welding in building work, pointing out that, as this is virtually a new development, any present failure would do much more to give welding in this field a setback than if welding already had been established definitely as a recognized, satisfactory process in building construction.

Benz Diesel Engine in America

The Chicago Pneumatic Tool Co. has effected arrangements with Motoren-Werke, Mannheim, Germany, acquiring exclusive rights to manufacture and sell the Benz solid injection Diesel engine in the United States and Canada. The Benz engine is of the vertical, multiple cylinder type, built on the four-stroke principle.

Advantages claimed for the engine include a simple and clear design, which eliminates the use of a high-pressure compressor, an injection cylinder with high-pressure pipe line and injection valve. There is no ignition device, which avoids a rather delicate apparatus, as well as spark plugs, cables, etc. Due to automatic regulation and simple operation, it can be run by men with limited engine experience, which tends to lower the cost of operation.

The Benz engine will operate on all kinds of petroleum and its derivatives, such as gas oil, kerosene, crude oil, paraffine oil and lignite tar. Regulation is effected by a precision governor which acts on an admission valve of the fuel pump, the quantity of fuel delivered being in proportion to the load on the engine. The fuel consumption is said to be low.

NEW 120-TON CAR DUMPER

Direct-Connected Slow Speed Engines with Balanced Piston Valves Are Features

A new 120-ton car dumper was recently installed for the Pennsylvania Railroad at Sandusky, Ohio, by Heyl & Patterson, Inc., Pittsburgh. The machine embodies a number of construction and operating advantages which, it is said, will greatly reduce the maintenance expense heretofore encountered with these machines and eliminate to a large extent, if not entirely, the breakdowns which in the past have frequently occurred, causing serious interruptions to traffic.

Most of the breakdowns and interruptions to service, it is asserted, were traceable to excessive vibration caused by high-speed geared engines, with unbalanced flat valves arranged in a vertical plane. The Pennsyl-

ous operation, provide a factor of safety about 50 per cent greater than has heretofore been common practice. With the large sheaves and this high factor of safety in the operating ropes, a long rope life is assured, it is asserted. A minimum thickness of $\frac{3}{8}$ -in. metal is strictly adhered to throughout the design of all parts of the structure.

The haulage engine, which is also direct-connected and of the large slow speed type with balanced piston valves, is provided with an automatic slow down and stop at each end of the haulage. A feature of the haulage car is the absence of a movable arm, this having been replaced with a spring buffer, which has a travel of 10 in. and, it is said, eliminates practically all of the shock both in the haulage car and on the draft gear of the road equipment. The arrangement for returning the haulage car to the pit at the foot of the incline is unique in that all swinging switches in the tracks have been eliminated, this being accom-



Car Dumper Built for Pennsylvania Railroad at Sandusky Said to Be Protected from Interruptions to Service Traceable to Excessive Vibration Caused by High-Speed Engines

vania dumper was, therefore, designed with direct-connected slow-speed engines, having balanced piston valves. In the same way, other parts of the dumper and its appurtenances were changed and improved.

The cradle hoisting engines are of sufficient size to hoist the maximum car with 100 lb. steam pressure at the throttle, and over 40 cars per hr. can be handled with engine speeds not exceeding 60 r.p.m. and the special design of the engines enables the operator to run them as slowly as 3 r.p.m.

The boiler plant consists of four 250-hp. dry back Scotch boilers and were built to the specifications of the Pennsylvania Railroad and the State of Ohio for 150 lb. pressure. Whereas dumpers previously built employ sheaves with a diameter 40 times that of the rope or less, the Pennsylvania dumper has sheaves with a diameter 48 times the diameter of the rope. The cradle is hoisted by four groups of $1\frac{1}{4}$ -in. cable arranged in seven parts. There are ten $1\frac{1}{4}$ -in. main counterweight cables and eight $\frac{3}{8}$ -in. clamp cables so arranged that they assist in elevating the cradle. The design of the cradle provides for a 50 per cent impact while hoisting. Previous practice, it is said, allowed no impact during this important operation.

Similarly the ropes specified, which are in continu-

plished by spreading the gage of the wheels of the haulage car.

One of the important features in the design of the dumper is the fact that the end posts of the A-frames are set with 65-in. clearance between them. This gives more latitude to the car riders in bringing the car to a stop on the cradle. Such accurate spotting as has heretofore been necessary is no longer required and hence the operation of the machine may be speeded up.

Approach and exit girders, 75 and 62 ft. long respectively, were installed. Although the cradle hoist and haulage car are operated by steam engines, all other movements of the machine are electrically operated by Westinghouse equipment, the current characteristics being 230 volts direct.

The operating cabs were designed and placed on the structure with special reference to plenty of vision and ease in control. A permanent electric jib crane was installed on top of the dumper with sufficient capacity and reach for handling all parts of the machine.

The Federal Trade Commission has established a branch office at 425 Lyon Building, Seattle, Wash., with Attorney Ellis DeBruler, Seattle, in charge.

Welding Applied to Manufacturing

Many Economical Uses Brought Out at Welding Society Meeting — New Developments in Thermit Process—Human Factor in Welding

THE advantageous use of welding as a manufacturing tool, as distinguished from its use as a quick and economical means of repairing broken and defective parts, was brought out in several papers at the fall meeting of the American Welding Society, held at the Massachusetts Institute of Technology, Cambridge, Mass., Oct. 21, 22 and 23.

An exhibit of welding equipment, the first to be held by the society, was a feature. There were 25 companies represented, all machinery being demonstrated in actual operation. For the benefit of welders who could not attend during the daytime, an evening was devoted to special demonstrations of the equipment.

IN addition to five technical sessions at which eight papers were presented research activities were discussed at a meeting of the American Bureau of Welding, which is the research department of the society. Social activities included a dinner and theater party. All meetings were well attended, and discussion was active.

Arc Welding Widely Used

ARC welding as a recent addition to the tools available for manufacturing, its rather wide application having come about to a considerable degree as a by-product of the War, was dealt with by H. M. Hobart, consulting engineer, General Electric Co., Schenectady, and W. Spraragen, secretary of the American Bureau of Welding, in a paper on "Arc Welding as a Manufacturing Process." Successful use of arc welding in repair work led, it was said, to the gradual adoption of the process in manufacturing work as a substitute for riveting where parts have to be fabricated.

Among the arc welding applications given were tubes in locomotive boilers; pipe lines for oil, gas, water, steam and for dredging; oil well casing construction; rail joints in street railway tracks; storage tanks for oil, water and gas; and fittings in ships and in joining hull plates. In an example given of arc welding in the construction of steel building the saving in the cost was 41 per cent of a similar riveted structure. In connection with the application of arc welding to steel buildings, it was said that "Architects have not yet acquired sufficient confidence in the arc welding process as a means of fabrication to adopt it for large structures. Also a competent supervisory force must be available in addition to the welding crew. There is undoubtedly necessary a new type of technical training, namely, welding engineering. Perhaps one good way to advance welding would be to interest various engineering schools to teach welding as a science, in addition to the present instruction in structural engineering. However, before taking this step, the theory and practice of welding design must be thoroughly worked out."

Welding was said to be entirely adequate for the construction of all kinds of pressure vessels. It is expected that the present restrictions in the A.S.M.E. code in regard to welding will be modified and made more liberal, based upon the scientific evidence now available and soon to be obtained by the pressure vessel committee of the society. Tanks designed for 250 lb. pressure were said to have withstood pressure as high as 2400 lb. before bursting. It was stated that welding can produce a better and cheaper tank than riveting when properly designed and constructed under approved technique and proper supervision. A \$100,000 investigation is to be undertaken shortly by the American Bureau of Welding. In fired pressure vessels, it was stated that many types of steam and hot water boilers and fired pressure vessels for various industrial purposes ranging from low pressure to high pressures and high temperatures are now in successful use.

Many other applications of welding were outlined and the use of arc welding in the plants of the General Electric Co., Westinghouse Electric & Mfg. Co., and the Lincoln Electric Co., were interestingly described.

Considerations to Be Observed in Adopting Welding

Fundamental considerations for manufacturers contemplating the introduction of arc welding into their shops for fabrication purposes were outlined. It was stated that structures and parts of products which it is intended to weld by the arc process should be designed properly to conform with the technique of arc welding. The substitution of arc welding for riveting in a structure designed originally for riveting was said to be a wrong basic principle. The material employed should be such as is known to be most satisfactorily arc welded, the great mass of important and satisfactory applications being said to be in joining mild steel parts. Adequate care should be taken in determining allowable stresses for welded joints. Other fundamentals discussed included material, welding rods, jigs and fixtures, testing skill of operators, inspection, testing of finished product, and speed of arc welding.

Arc Welding at Norfolk Navy Yard

In the discussion of the paper, J. W. Owens, electrical aide for welding, U. S. Navy Yard, Norfolk, Va., said that the paper should be of marked value in acquainting executives and engineers with the extensive possibilities of arc welding as a manufacturing tool, and should go far in breaking down the extreme conservatism of those who refuse to authorize this method of joining metals. The reason usually advanced for the non-use of welding was, he said, that the "strength of the weld is entirely dependent on the operator" and that you "can't test the joint." Today, he said, if a weld fails, the fault lies with the designing or supervisory force and not with the welder, because it has been proved conclusively that the ability of a welder can be determined accurately before his assignment to a particular job.

Mr. Owens differed from the authors of the paper in the range of carbon content of steel which permitted good welding conditions. The authors gave a range of 0.10 to 0.20 per cent carbon, but Mr. Owens said that good welding can be secured on medium steel ship plate, all of which contains approximately 0.25 per cent carbon. It was stated that because of the increased rigidity of the joint, inherent with the higher carbon content, it is essential in the design of ship structures that lap and tee joints be used exclusively instead of butt joints. The use of these joints permits of assembling the structure before any welding is done, which was stressed as an advantage. Good thermal conditions, also, permit the use of larger electrodes and higher current values, thus increasing production.

In touching on the necessity for suitable equipment for welding, Mr. Owens pointed out that the non-use

of large electrodes and higher current values, more suitable for thermal capacity for $\frac{3}{8}$ in. and $\frac{1}{2}$ in. material, was due to the fact that machines in use could not sustain a continuous load with electrodes larger than $\frac{1}{2}$ in. He felt that there was need for the adaptation of existing automatic welding machines to the welding of large production jobs such as met with in ship construction.

In outlining the welding being done at the Norfolk yard, it was stated that seven metal arc welded battle towing targets of approximately 4500 lb. weight have been constructed. The welded targets were said to have supplanted the riveted type, the cost being lower as well as the weight. A pontoon for a 120-ton derrick in which the entire shell, deck and two bulkheads are metal arc welded, is also being constructed. The pontoon is 132 ft. long, 35 ft. 10 in. beam and 12 ft. molded depth. There will be a total of 6652 ft. of fillet welds in its construction. The shell plating is $\frac{3}{8}$ in. and $\frac{1}{2}$ in. thick and lap joints are used. Many gasoline, fresh and salt water tanks have been built and large number of pipe fittings. Steam pipe lines have also been constructed, also a hydraulic shop line, 200 ft. long for 1800 lb. working pressure. Both gas and metal arc welding were employed and the joints were of the butt type. The work cited by Mr. Owen reflected a progressive attitude on the part of the Navy Department, particularly the Bureau of Construction and Repair, and in the case of the pontoon, the Bureau of Yards and Docks which authorized the use of welding.

Steel Automobile Bodies Welded

AN outstanding paper was that of Joseph W. Meadowcroft, superintendent of the Edward G. Budd Mfg. Co., Philadelphia, on "Welding All Steel Automobile Bodies," this paper, illustrated by moving pictures, being given at the closing session. Mr. Meadowcroft's company employs more than 6000 welders, and is regarded as the largest user of welding equipment in the world. The present capacity of the plant is in excess of 800,000 automobile bodies a year.

The moving pictures gave what was in effect a tour of the plant, starting with the experimental, model, and pattern departments through the press shops and welding departments to the final inspection. The magnitude of the press and welding operations was impressive, as also the unique jigs and fixtures used in welding operations, and the material handling methods. The present plant consists of 12 buildings, the floor space occupied being more than 1,235,000 sq. ft. Railroad sidings are provided to permit of shipping 100 carloads a day. The press shop is one of the largest and most modern in the United States, and the steel used totals approximately 500 tons a day. Of the steel 23 or 24 per cent is waste, most of which is blanked and formed into various small commodities by the by-product department of the company. Special attention is paid to safety, from the production as well as humanitarian standpoint, the safety appliances provided for the presses and other equipment numbering up into the thousands.

In his paper Mr. Meadowcroft touched on spot welding particularly because of the advancement in the spot welding of light sheet steel. In discussing the use of spot welding in place of riveting it was said that the welds were strong, the production large, the cost lower and the operation cleaner. At the same time the investment in tools and the maintenance cost has undergone a notable reduction. The Budd company was mentioned as the first to adopt the method for manufacturing all-steel automobile bodies, the first of which were made in 1912.

In the production of the steel automobile bodies, the sheets are stamped and formed in presses and then assembled in special electric welding machines having attachments to permit of welding all parts or units of the body together and hold them uniformly. These special fixtures permit all parts which have contours to be held in their proper position while being welded, and assure sound welds. Sufficient allowance can be made in the welding fixtures for expansion and contraction, which is so frequently a source of trouble in welding large bodies of metal together. All of the

various parts of the body are clamped together so that in making spot welds good contacts are assured. This was stressed as essential as it is necessary to spot weld the various sections of the body together so that the indentations in the metal are more or less eliminated. In the company's daily production 18,000,000 spot welds are made on standard and special machines.

Apprentices Receive Thorough Instruction

THE method of instructing electric spot welding apprentices was outlined. Caution was said to be necessary in the selection of clothing worn by the apprentice while operating a machine. The wearing of cotton garments was a hazard stressed, the danger being in the flying sparks or flying molten metal which fall upon the fuzzy surface of shirt or apron and set them on fire. The wearing of woolen shirt and leather apron was strongly recommended. It was said to be just as dangerous to work around an electric welding machine without proper clothing as around a press that is not properly safeguarded. Stress was placed on the selection of goggles, which should be adjustable for the proper distance between the eyes, should be properly ventilated and have side shields. The apprentice is thoroughly instructed as to the parts and use of the electric spot welding machine. When the training period is ended, the apprentice is placed in one of the assembly departments under the supervision of a welding foreman, who is responsible for the quality and quantity of the work turned out by the apprentice. The apprentices are advanced from time to time in accordance with their ability to do a higher class of work. As all operators are paid according to the class of work they are doing, there is always a goal for them to work to, which was emphasized as obtaining the best results for both the operator and the company.

A section of the paper was devoted to the elimination of "low spots" caused by spot welding sheet metal, and another to the strength of spot welds. In answering the question as to how spot welds and riveted joints compare in strength, Mr. Meadowcroft said that there is no substantial difference in their use of them. If two thin pieces of metal and two thick pieces be riveted with rivets of the same size there is a certain thickness of metal below which all failures will arise through the tearing of the sheet and above which failures will be due to the shearing of the rivet. The same was said to be true of spot weld if the area of the spot weld be held constant. A table of test results on spot welds applied to sheets of different thickness, but with the area of the weld itself kept nearly constant, was included in the paper.

In discussing the safety and protection afforded owners of automobiles by the welded all-steel automobile bodies, it was predicted that in the next five or ten years every automobile company of size will adopt the all-steel body. This, it was pointed out, will mean a significant advancement of the welding industry as a whole.

During the showing of the moving pictures, Mr. Meadowcroft answered questions freely as to various features of the methods and equipment used at his plant. At the conclusion of the session, he received well deserved commendation from all sides for the unusually interesting and instructive material presented.

Progress Made in Thermit Welding

THE elimination of an internal defect referred to as "cleavage planes" was among newer developments in Thermit welding, outlined in a paper by J. H. Depeler, chief engineer, Metal & Thermit Corporation, Jersey City, N. J. This defect was discovered in a test run made at the Bethlehem Steel Co., Steelton, Pa., for the purpose of securing the approval of Lloyds Register of Shipping for the use of Thermit welds on stern frames and other important structural parts of ships. In these tests, the welds were broken under a drop after all excess metal had been machined off and it was discovered that there existed an area just below the axis of the piece, on a vertical plane running through the middle of the gap, where the metal had been torn apart during solidification and around which the crystals had been very much overstrained. The

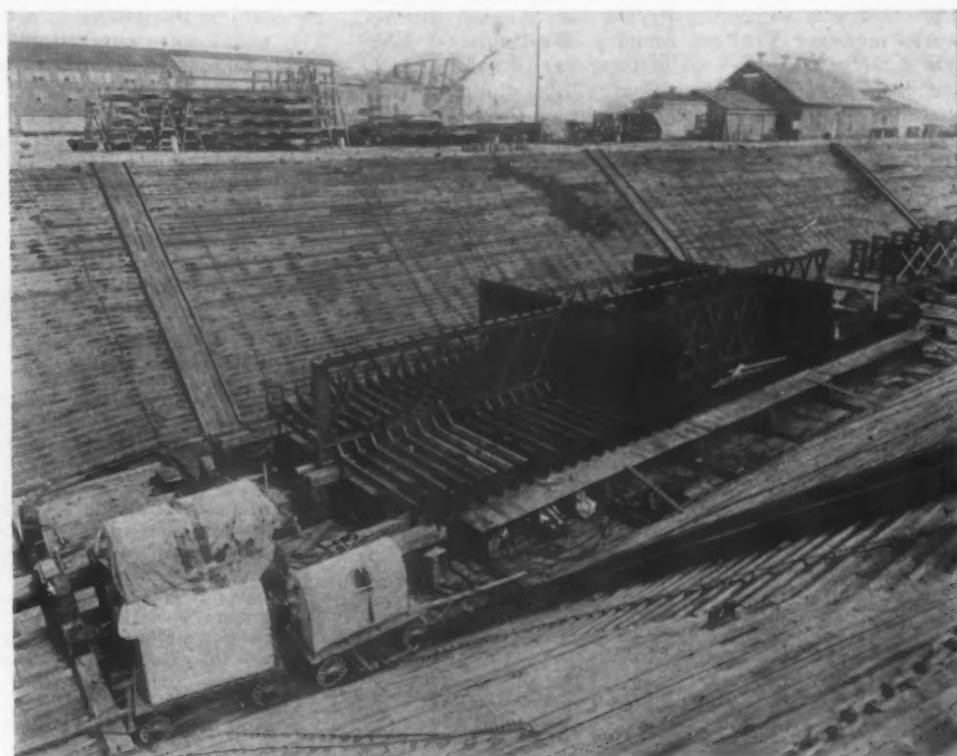
cause of this phenomena, as determined from a study of it, was outlined briefly by Mr. Deppeler.

It was found that by careful proportioning of the gap, width and thickness of collar and by reducing the riser to a minimum, the cleavage plane was eliminated, which, from an engineering standpoint, was stressed as a marked step in advance. It was stated also that from the standpoint of economy the Thermit weld is in a much better position, because the new design permits of using less than half the amount of Thermit previously used. This, because of the coincident saving in crucibles, size of mold and labor of ramming the mold was said to cut the cost of welding in half, makes it economical to extend the process to the lighter sections, and in the steel mill, for instance, to extend the

"Field" by A. W. Moulder, chief engineer, heating, power and industrial piping division of the Grinnell Co., Inc., Providence. It was stated that large as was the aggregate amount of welding done in that field, it does not approach the amount that the many advantages of welding should produce.

The one thing that has intervened to keep all-welded pipe lines in power plant work from being the rule, rather than the exception, is in Mr. Moulder's opinion, the importance of the human factor in welding. Because of that human factor, no weld can be better than the welder. Quality of workmanship becomes the measure of strength and reliability, and because workmanship cannot be specified like weight of pipe or strength of fitting, welding has fallen far short of the wider

Welding a Pontoon for a 120-Ton Derrick at the Norfolk Navy Yard. The entire shell, deck and two bulkheads will be metal arc welded, the welded bottom and bulkheads being shown



use of Thermit to a large number of parts which previously could be almost as cheaply scrapped and remade. The new methods were said to have made the crucible problem much less important because in the big welds where two or more large crucibles were used, only one is now necessary.

Another development in Thermit welding which the company has been working on, is in the improvement of crucibles. Crucibles made of various metals of relatively high heat conductivity were said to have been developed, the most practical of which probably is steel. The thickness of the crucible wall has been designed so that it will cause a thin layer of alumina slag to freeze on its inner surface and not allow the crucible wall itself to be washed away. A crucible so designed without any lining at all, was said, as far as known, to be practically everlasting. It was stated that such crucibles have been in use for over 500 reactions and are as good today as when they were made. The small sizes have been developed first, as the thickness of the wall at the various diameters is a matter of experiment. The delay in giving this new development to Thermit welders was said to be due principally to inequalities in the crucible wall caused by segregation in the steel castings. These difficulties are being overcome and it is expected that these crucibles will be placed on the market shortly.

Gas Welding of Power Plant Piping

THE possibilities of welding in the field of power plant piping were outlined forcefully in a paper on "Gas Welding of Power Plant Piping in Shop and

uses its unquestioned advantages should have secured for it.

In regard to the efforts being made to counterbalance this dependence on reliable workmanship by the design of various more or less elaborate types of weld, Mr. Moulder stated that in their experience the effort to have design make up for possible poor workmanship was wasted effort, because there is no substitute for integrity. Although in their work some of these elaborately designed welded joints have been made, it was said that in their experience the plain butt weld, properly made is as strong, or stronger than the base material itself.

The great bulk of this fabrication by welding has been in shops of manufacturers engaged in that work, but some of these companies have successfully done pipe line welding in the power plant itself. This latter development was said to have grown rapidly, in some few cases having been carried to the extent of eliminating, on some lines, practically all fittings and providing flanges only adjacent to valves and apparatus.

Headers Produced at Lower Cost

LOWER first cost was cited as the first advantage of the welding of power plant piping. In the case of two simple headers described, \$332 was the cost of the welded header and \$1,034 the cost of a header for the same purpose but made up of the same weight steel pipe with lap joint flanges and extra heavy cast

(Concluded on page 1226)

HEATING MOLDING SANDS

High Temperatures Destroy the Bond—Two Sands Compared

That a knowledge of the limit to which molding sands can be heated without losing their bond would be very helpful to foundrymen in solving their sand problems, Jesse L. Jones, in charge of the chemical and experimental laboratory Westinghouse Electric & Mfg. Co., East Pittsburgh, told members of the Pittsburgh Foundrymen's Association at the monthly dinner and meeting of that organization at the Fort Pitt Hotel, Pittsburgh, Monday evening, Oct. 19.

Mr. Jones presented an interesting paper covering a comparative test of Pittsburgh loam and Millville gravel for use in making heavy gray iron castings. This test was suggested by the late August Slusser, works manager Trafford foundry, Westinghouse Electric & Mfg. Co., who while temporarily in charge of the company's foundry at South Philadelphia, noticed that Pittsburgh loam, used at Trafford for heavy gray iron castings, not only had a much longer life than Millville gravel used for similar work at South Philadelphia, but that it also made a stronger mold.

In making the tests to determine the reasons for the apparent superiority of Pittsburgh loam, the standard methods of the American Foundrymen's Association were employed. The results follow:

Analyses		
	Pittsburgh Loam	Millville Gravel
Moisture at 105 deg. C.	1.60	1.30
Loss on ignition	2.50	2.25
Silica	82.92	90.80
Alumina	4.64	4.44
Ferric oxide	6.01	1.54
Titanium dioxide	0.29	0.22
Magnesia	0.55	0.25
Lime	0.32	0.03
Potash	2.17	0.32
Soda	0.93	0.02
Fineness Test		
Sieve No. 6	11.18	1.85
Sieve No. 12	10.92	9.49
Sieve No. 20	6.92	24.86
Sieve No. 40	15.38	31.02
Sieve No. 70	16.83	13.16
Sieve No. 100	5.38	1.80
Sieve No. 140	3.66	0.97
Sieve No. 200	4.15	0.93
Sieve No. 270	1.92	0.28
Clay	10.42	2.51
	12.91	12.89
Dye Absorption Test		
Dye absorbed by 25 grams of sand	0.151	0.140
Permeability Test		
Moisture, 4 per cent	92	463
Moisture, 6 per cent	103	346
Moisture, 8 per cent	176	232
Bond Test		
Moisture, 4 per cent	203	
Moisture, 5 per cent	191	
Moisture, 6 per cent	190	213
Moisture, 8 per cent	171	160

A number of cylinders of the two sands, 1 in. in diameter and 2 in. high, were rammed up on the permeability test apparatus. Compression tests were made at room temperature and, after heating to various temperatures up to 725 deg. C. in an electric furnace, it was observed that the Millville gravel cannot be safely heated above 400 deg. C. without its bond being destroyed, while at 725 deg. C., the highest temperature reached in the test, the Pittsburgh loam was still quite strong. This explains the short life of the Millville gravel and the necessity of frequently adding new sand to it. The writer is unable to say just what is the exact mechanism of the loss of life in the bond of the Millville gravel. It will be noted, however, that the bond of the Pittsburgh loam contains 4.64 per cent of alumina and 6.01 per cent of ferric oxide, as against 4.44 per cent of alumina and 1.54 per cent of ferric oxide for the Millville gravel. Perhaps the high percentage of ferric oxide in the Pittsburgh loam enables it to resist dehydration and hence to retain its bonding power.

It is also evident that foundries using sands, the bond of which suffers from exposure to high temperatures, should be very careful in baking or skin-drying not to exceed the critical heat at which strength dis-

appears. In many foundries coke fires are built in the mold itself, the burning coke being in direct contact with the surface of the mold. Even when the coke is suspended above the mold in an iron basket or when a torch is used for drying, it is a question whether temperatures are not reached that are a detriment to the integrity of the mold.

During the recent European trip of the American Foundrymen's Association it was noticed that the baking of molds in most of the larger foundries was conducted with greater care than seems to be used in the United States. Many foundries dried their molds by passing heated air into them. This heated air was generated by blowing air at room temperature over incandescent coke with the aid of a blower. One Belgian firm had a very extensive array of driers of this type. They had pipes leading from the heating chamber of the furnace to the mold, so that the heated air could be introduced at a number of different points. The molds were covered in the usual way with iron sheets to prevent the too rapid escape of the heat. By the use of mold heaters of this type, it is reasonable to suppose that temperatures that would injure the molds and weaken their surfaces would not be obtained, yet the drying would be done rapidly on account of the large volume of heated air that is introduced.

The author of the paper recently had the opportunity to examine a large mold made from Millville gravel and baked with a direct coke fire. While the skin of the mold was fairly strong, just under the skin the sand had lost its bond to such an extent that, if poked by the finger, it would rattle out like quicksand. Mr. Jones' conclusions are:

1. Where a molding sand has to be used, the bond of which is rapidly destroyed by long exposure to high temperatures, the molds should be shaken out as soon as the castings reach a dull red. Cast iron being as strong at 556 deg. C. as it is at room temperature, there should be no more danger of the castings cracking from rough handling than if they were allowed to get cold before shaking out. The castings would not be made any harder by this treatment, although internal stresses might be set up in them if they were cooled unequally or were of unequal cross-section. This should give the sand a longer life and reduce the amount of new sand that must be added to the heaps.

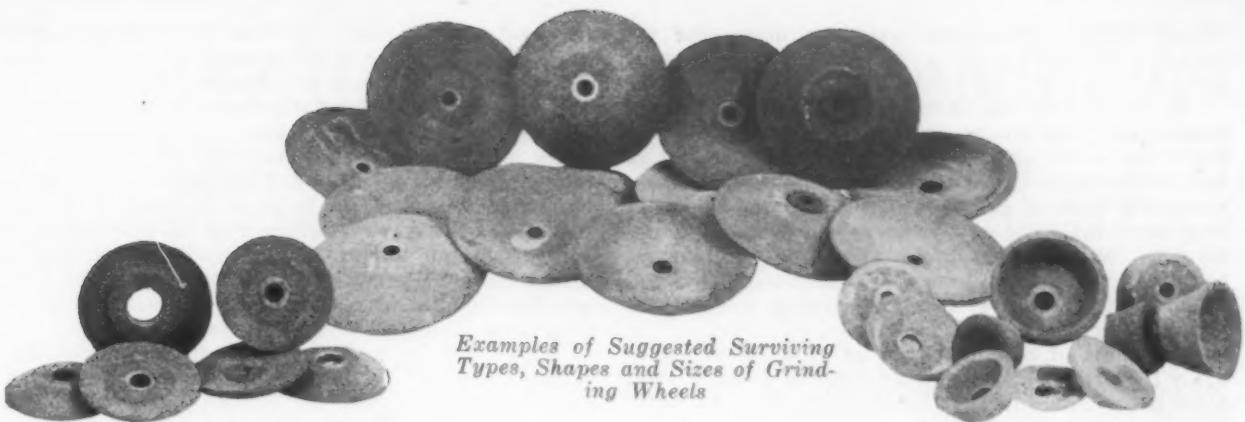
2. Any foundry using a sand like the Millville gravel and drying its molds should devise a mold drier that will dry at a moderate temperature or consider obtaining such a drier from a manufacturer of foundry supplies.

A Plea for the Machine Tool Industry

In a recent issue of "Trade Winds," the house-organ of the Union Trust Co., Cleveland, is an article entitled, "A Plea for the Machine Tool Industry," which was written by J. R. Kraus, vice-president and executive manager Union Trust Co. A few paragraphs from this article follow:

"May I suggest that the purchaser should view the price of a machine tool in the light of its usefulness and the inventive genius which has gone into its construction, rather than solely upon the per-pound basis. Brain work cannot be sold by weight, and the machine tool trade should secure always an adequate return upon the scientific and mechanical skill and learning which is necessary to the manufacture of its product."

"Let me urge, too, that the buyer of machine tools should regard them an investment rather than an expense. I know that it is customary in many industries and is often considered good policy to charge off the entire cost of a new machine tool within a year. While this might be entirely justified in the case of office fixtures, furniture or items which do not enter actively into production, I do not feel that such stringent financial attitude should be adopted toward machine tools. On the books of the company machine tool costs might better be spread over a period of years commensurate with their life and usefulness. Such a plan might make the attitude of the purchaser toward the cost of new machinery much more lenient and equitable."



Examples of Suggested Surviving Types, Shapes and Sizes of Grinding Wheels

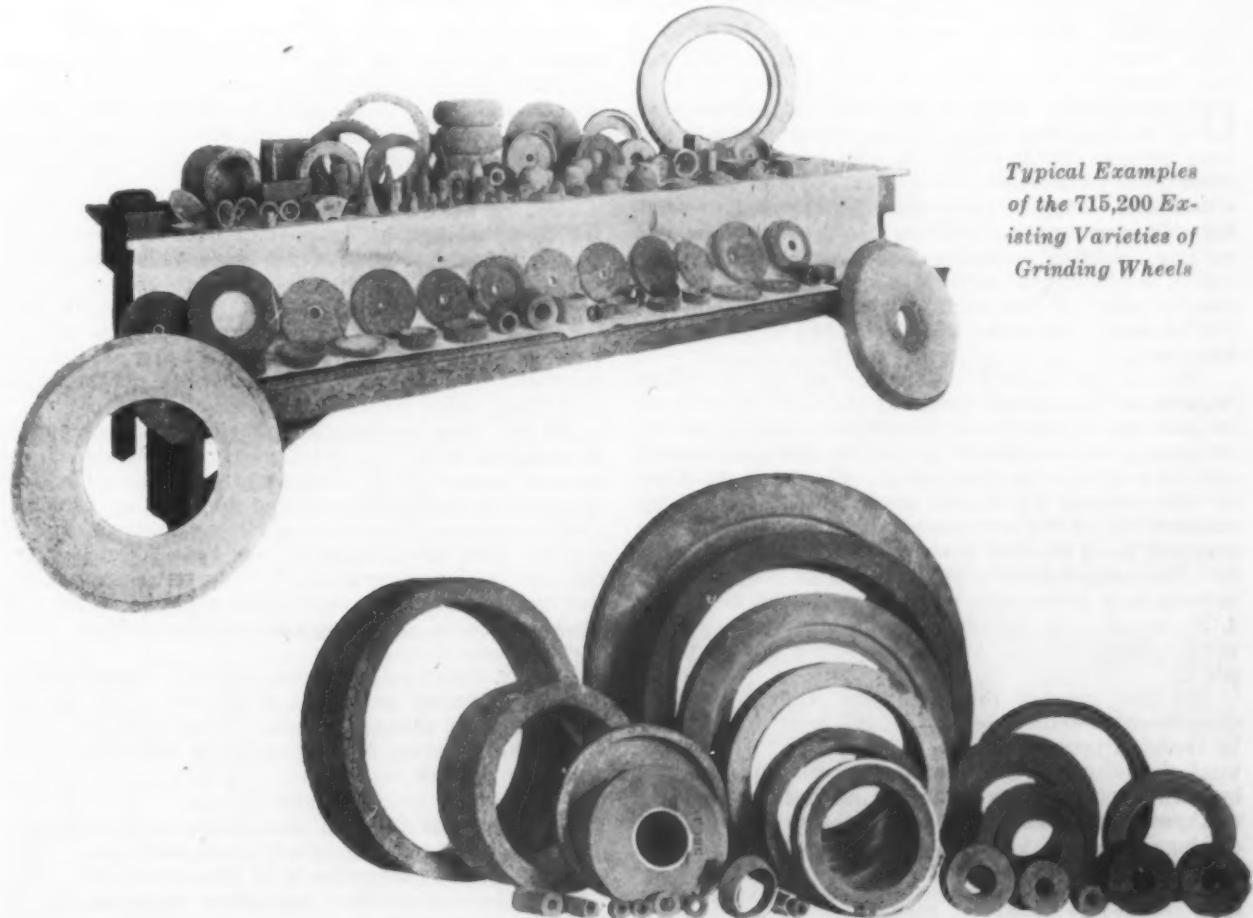
Simplification of Grinding Wheels

Division of Simplified Practice Takes Steps to Obtain General Support for Sharp Reduction in Number of Grinding Wheel Sizes

A NOTHER step toward reducing the number of stock sizes of grinding wheels from a total of 715,200 to 255,800 is about to be taken by the Division of Simplified Practice, Department of Commerce, Washington. This will be in the nature of following up action taken at a general conference of manufacturers, distributors and users in Washington on Sept. 23 when it was voted to make the reduction. A report of that meeting was published in *THE IRON AGE* of Oct. 1, page 909.

It was then recommended that the simplified program be applicable for one year, beginning Jan. 1, 1926, and that existing stocks be cleared by July 1, 1926. With this end in view, the division is preparing to take a referendum among producers, distributors

and users, asking for their acceptance of the program. Realizing that simplification would be without value unless put into actual practice, the division is pressing the lead of manufacturers in recommending the program. Before it puts into effect any plan the division requires approval by at least 80 per cent of each of the three interested groups, manufacturers, distributors and consumers. The program is the result of work carried on for several years by the grinding wheel industry in which an intensive survey was made of sales records. It was developed by a committee on simplification headed by George W. Chormann, Carborundum Co., Niagara Falls, N. Y., who also represents the Grinding Wheel Manufacturers' Association of the



Typical Examples of the 715,200 Existing Varieties of Grinding Wheels

United States. Estimates have been made that the program will mean a net saving of \$5,000,000 annually to producers, distributors and users.

E. W. Ely of the Division of Simplified Practice pointed out that the recommendation will in no way embarrass users who possess grinding machines which may have been designed to accommodate certain of the eliminated sizes of grinding wheels. In the course of time new wheels and new grinders will be made to conform to the simplified list. Meanwhile all current equipment will get the benefit of service and there will be no need to scrap or discard grinding machines or any of their parts.

The effort of manufacturers of grinding wheels to apply the principle of simplified practice actually antedates the entrance of the United States into the world war. But it was without success at that time. It has been stated that it required the rigors of war itself and the insistence of the War Industries Board to convince American industry that simplification was not only vital but necessary. Businesses that pruned their stocks down to the essential minimum during the war, it has been stated, made such a saving that there followed a repudiation of the hypothesis that variety is the sole source of profit.

Profiting by this change in business ideas, the grinding wheel manufacturers in 1920 again sought to formulate adequate and universally acceptable standards that would be beneficial not only to them, but to distributors and users alike. The present simplified program is the result. The heavy slash in types, shapes, and sizes of grinding wheels is one of the most sensational made in any simplification conference, and it is confidently believed there will be further reductions. A complete list of existing sizes of each type

of wheel was compiled, and these were checked against each other diagrammatically, so as to produce a minimum number of composite shapes which would meet the present-day machine requirements and satisfy the grinding wheel manufacturers. In discovering entirely adequate composite shapes many troubles were encountered due to the varying diameters controlled by the diameters of the holes to be ground, and also because of the many existing sizes of arbor holes for the various internal production machines and internal attachments. With the cooperation of machine builders, the Committee on Simplification succeeded in settling upon diameters and thicknesses.

As pointed out by Mr. Chermann, the simplification proposed covered only six types of wheels—internal, cylinder, straight cups, flaring cups, dish wheels and double cups, of which there are 414 existing shapes. The program calls for a reduction to 144. He also stated that the program favors doing away with six of the nine sizes of arbor holes for wheels from 10 to 26 in. in diameter, retaining only the 5, 8 and 12-in. sizes. In dish wheels it is proposed to reduce the existing 38 shapes, with possible stocks of 30,400, to nine shapes with stocks of 7200, a saving in stocks of 23,200. It is proposed to adopt dish wheels of seven different diameters over all.

The program does not interfere with existing grits and grades, which it was asserted, are subjects for technical consideration. It was explained, however, that the Committee on Grading of the Grinding Wheel Manufacturers' Association is preparing to develop a chart which will show the comparative grades as between the products of different manufacturers for the same type of work, and which will be a guide to the consumer in meeting his requirements.

Practical Foundry Cost Accounting

Division into Melting, Molding, Cleaning and Pouring Costs
—Adds 6 Per Cent on Investment

BY E. T. RUNGE*

OBSERVATION leads to the belief that 95 per cent of all foundries either have no cost system whatever, or impractical ones. Foundries are no different from other businesses in that a cost system should be a compass, telling in which direction the craft is tending. It is convenient to divide the foundry costs into melting, molding, cleaning and pouring costs. All others can be related to these. As gray iron foundries number 4500 of the total of 6000 foundries in the United States, our study will be confined to this numerous group.

Mr. Runge showed a number of charts which brought out the specific points of his talk. In one case he gave the figures for a foundry making 400,000 lb. of castings in one month, 500,000 lb. the next month, and 200,000 lb. in the third month. He traced the items of cost through his sheets, some of the items being independent of the melting, and showed that on his assumed basis the cost the first month was 5.61c. per lb. The second month, because of higher output and consequently lower unit overhead cost, the total was 4.73c. per lb. In the third month, however, with the much reduced output, the total worked out at 9.70c. per lb.

He then grouped the three sets of figures into a three-month total and found that the total cost, divided by the total production, gave 5.95c. per lb. Taking the total of 1,100,000 lb. as the production for three months, he then applied several different methods of figuring this product, depending upon whether the individual castings were heavy or light and upon the extent of

core work. By this analysis he showed great variations in costs per pound, and pointed out how foolish it is for a foundry to judge by poundage alone or to quote on that one basis.

Taking next a set of highly-cored castings of low individual weight, he figured out the cost by two different methods which take into account all of the necessary factors, finding that one came to 20.95c. per lb., and the other to 21.38c. per lb. Either one of these would be a satisfactory cost figure under the circumstances. Using the three-month figure originally found, however, at 5.95c. per lb., the foundry quoting upon that basis would have a large deficit to swallow.

In his work on behalf of the Ohio Foundrymen's Association, and more particularly of certain of the member foundries, Mr. Runge had gradually added into the cost sheets figures covering depreciation, administrative salaries, insurance and other matters, one at a time. The last item which has been added is 6 per cent on the investment in the foundry plant, on the theory that the money so invested could be invested in stocks or bonds, paying 6 per cent and without ordinary business risk.

It was moved by a member that the Runge method of cost accounting be made a definite study by the cost committee, and that the results of this study be placed before the members for application in their own work. This was carried.

The Union Minière du Haut Katanga is now producing and will offer its cobalt metal, salts and oxides to consumers beginning early in November. The company's cobalt department has offices in room 609, 67 Wall Street, New York.

*Consulting cost accountant, Cleveland. Abstract of paper before the American Foundrymen's Association at Syracuse, Oct. 6.

Unions Attack Improved Conditions

Claim that Pension and Insurance Plans, Stock Ownership and Company Unions are "Deceptions" of "Wicked" Employers

THAT organized labor spends \$120,000,000 a year for class control and class propaganda as contrasted with less than \$7,000,000 spent by organized employers for the same purpose was the statement of Philip Stremmel, assistant superintendent National Enameling & Stamping Co., Granite City, Ill., before the National Safety Congress in Cleveland recently. It now appears, from the annual report on employment relations just issued by the National Association of Manufacturers, that not only is the difference between amounts expended for propaganda very great, but that the manner in which these sums are expended contrasts even more sharply. Whereas the employers' organizations are steadily driving toward improved working conditions, many of the progressive steps taken in the last ten years are being attacked by the unions as mere "deceptions and trickery." Says the report:

"It may be stated that there appears to be a concerted effort by certain organizations to attack all plans and methods designed to improve employee-management relationships which have been put into operation in individual plants through the action or at the suggestion of the management, and not only have these plans and methods been criticised, but a serious attack has been made on the motives of employers. For example, the American Federation of Labor has declared:

"The A. F. of L. special committee that investigated the life insurance business has exposed the pretense of those employers who profess such an interest in their employees' welfare that they furnish them life insurance.

"The company "union" is another phase of trade union antagonism under which the deceived worker is given the form but not the substance of self-help.

"Equally deceptive is the sale of company stock to employees who are unacquainted with the speculative character of all common stock.

"The employer's pension scheme, however, is the limit for trickery and deception.

"Organized labor must expose these deceptions."

The committee on employment relations of the

National Association of Manufacturers calls attention to these quotations as a warning against the influence that is being exerted to overcome the good results of plans which have been evolved, not always at the suggestion or at the will of the employer, but in accordance with desire of employees for measures which appeal to them as being in their interests.

"The real reason for such attacks by organized labor is due to the fact that the increasing horizon of the worker by education, by the methods which have been adopted to give him a better knowledge of the business in which he is engaged, and the better working conditions which manufacturers have generally adopted have tended to make the worker better able to see the direction in which his own interests lie than heretofore, and such assertions as those quoted above are, therefore, prompted by the feeling that all of such efforts tend to weaken the ability of organized labor as an organization to induce the affiliation of the individual workman.

"This explanation of the recent attacks on the motives of industrial management is substantiated by the following statement submitted to the 1924 convention of the American Federation of Labor by its Executive Council:

"It is evident that our trade unions must render increasing service to our membership to conform to our growing standards of industrial and social welfare."

"It is clear that these 'growing standards of industrial and social welfare' have not been established by the trade unions which are advised to meet or conform to such growing standards.

"In other words, the manufacturers of this country, most of whom operate without closed shop agreements with the unions, have voluntarily or in concert with their workers established 'standards of industrial and social welfare' exceeding those of the closed shop unions and the vast majority of workers are finding it unnecessary to join the trade unions to secure an economic square deal and the unions therefore desire to make the workers believe that all such movements have been adopted for selfish motives not conducive eventually to the interests of the workers."

Jones & Laughlin Steel Corporation to Install 60 Wilputte Coke Ovens

The Jones & Laughlin Steel Corporation has taken the step that will make it entirely self-contained in the matter of coke supplies. Another battery of 60 ovens is to be built at the Hazelwood, Pittsburgh, plant by the Wilputte Coke Oven Corporation. This addition will bring the total number of ovens at this plant to 300. When originally projected, during the world war, the plant was to have consisted of five batteries of 60 ovens each, but only four batteries were completed. These are Koppers ovens.

The company has under construction at its Aliquippa Works, Woodlawn, Pa., 122 Becker type Koppers ovens and with the completion of the Hazlewood addition it will have a total of 422 ovens with an estimated capacity of 1,957,000 net tons of coke annually. The company has 12 blast furnaces, with a rated annual capacity of 2,100,000 tons. Production of a ton of basic iron with 1900 lb. of by-product coke is regarded now as ordinary practice, and on that basis, the Jones & Laughlin Steel Corporation in a year or so will have all the by-product coke-making capacity needed to meet its full requirements.

Steelton Blast Furnace to Go In

HARRISBURG, Oct. 26.—The Steelton, Pa., plant of the Bethlehem Steel Co. plans to place a third blast furnace in operation this week. This furnace has been out since May. Few additional men are to be hired, for there are now more than 5000 on the payrolls, which is near the high mark for normal conditions. With the relighting of the furnace, more coke ovens will be put in operation, raising the total to about 180.

Ship and Boat Building in 1923 forms the subject of a pamphlet issued by the Census Bureau, comparisons being made with 1921, 1919 and 1916. Copies of the pamphlet may be had at 5c. each from the Superintendent of Documents, Washington. The value of product in 1923 is given as \$213,232,382.

The first unit of the plant of the Dominion Alloy Steel Corporation, at Sarnia, Ont., has been in operation for some time on the production of galvanized sheets. It is understood that the sheet mill is now over 75 per cent complete and that within a few months the plant will make its own black sheets.

New Double-Housing Planer

Feed and Traverse of Heads and Movements of Cross-rail Accomplished by Means of Motor on the Rail—Pendant Switch Facilitates Operation—Rapid Clamping

NOTEWORTHY refinements intended to provide ease of operation, increased rigidity, minimum of maintenance cost and safe operation have been incorporated in the planer illustrated, which is a recent addition to the line of the Niles-Bement-Pond Co., 111 Broadway, New York. The machine, named the Timesaver, is available in 36, 42 and 48-in. sizes.

Ease of operation has been provided and at the same time the construction of the machine simplified by utilizing the motor at the end of the cross-rail for power traversing and feeding the cross-rail heads and side heads, and for elevating and lowering the cross-rail. This motor is controlled by the pendant switch shown in Fig. 1 and also by the table dogs.

The arrangement for directional control of the cross-rail, cross-rail heads and tool slides may be noted from the close-up illustration of the end of the rail, Fig. 2. Lever A controls the direction of movement of the cross-rail, which is elevated when the lever is thrown up and lowered when the lever is thrown down. The four-position lever C controls all the motions of the front cross-rail head. When this lever is thrown to the left or right, the head moves to the left or right; when thrown up or down the tool slide moves up or down accordingly. In a similar manner lever D controls all the motions of the back cross-rail head. The amount of feed to the cross-rail heads is controlled by lever B, the feed to the side heads being independently adjustable. Levers C and D regulate the direction of motion of the cross-rail heads whether in the operation of feeding or traversing. The distance that the head is traversed is controlled either by means of the levers or by a twist of the pendant switch knob, the latter serving merely to control the starting and stopping of the motor on the cross-rail.

Duplex control is provided so that the machine may be operated from either side, which is an advantage,

particularly when a side head is employed on each side of the machine. The convenience of this duplex control may be noted from Fig. 3, in which the operator is shown selecting the direction of motion of the back rail head with his left hand and controlling the amount of motion by twisting the pendant switch knob with his right hand. The levers on the back of the machine are connected directly by rods extending across the cross-rail to the control levers at the front of the machine, no other mechanism than the levers and rods being required. It will be noted that the pendant switch may be swivelled for convenient use on either side of the machine.

The pendant switch knob has four vertical positions as shown in Fig. 1. In the first or safety position all motors are stopped. The second position down is for inching the table in either direction, and the third position down is for traversing the heads, setting the tools and elevating the cross-rail. When the pendant switch knob is pulled down to its lowest position, the main driving motor and the motor at the end of the rail is controlled from the dogs on the table, and the automatic feed becomes operative.

The pendant switch is electrically interlocked with the rocker lever at the side of the bed so that when the switch is pushed to the upper position, the rocker at the side of the bed is made inoperative. This switch control also permits of interlocking the driving motor and cross-rail motor so that the table cannot be started while traversing, it being also impossible to traverse while the table is moving back and forth.

The operation of the pendant control may be illustrated in connection with the set-up shown in Fig. 3. In setting up this job, the operator would push the knob to the highest position so that the table could not be started up by accidental knocking against the rockers at the side of the bed. In setting the tools to the work,

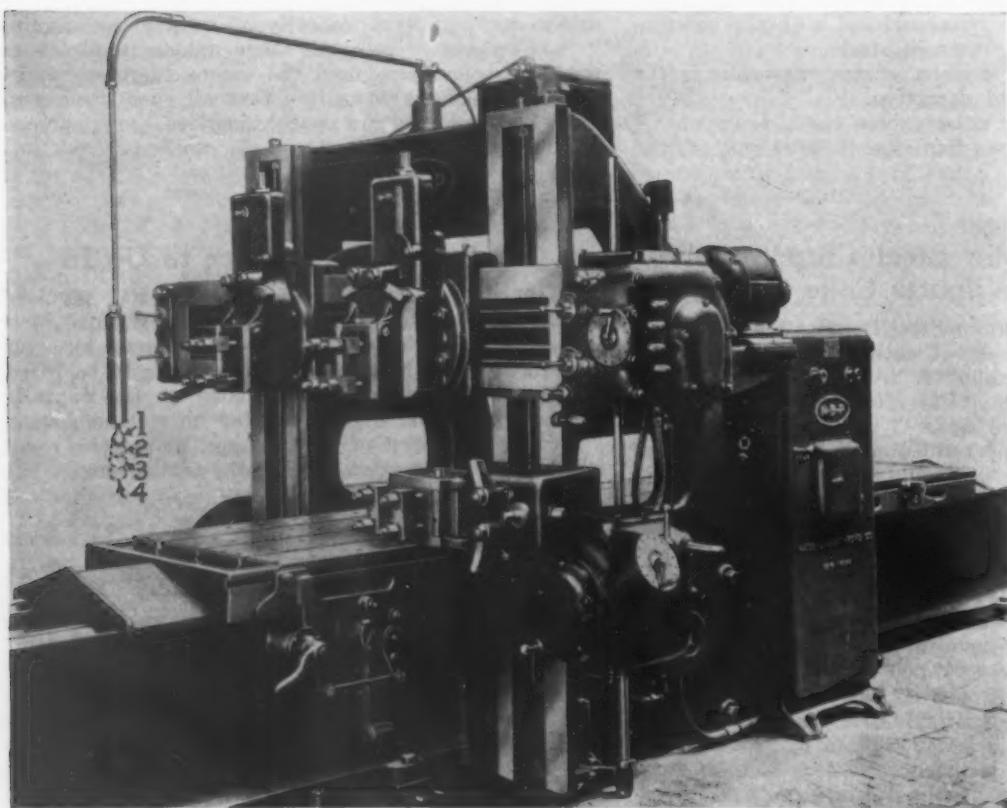


Fig. 1—The Motor at the End of the Crossrail Is Utilized for Feeding and Power Traversing the Rail and Side Heads and for Elevating and Lowering the Rail. The pendant switch knob, which has four vertical control positions as shown, controls the operation of the motor. The machine may be operated conveniently from either side of the table

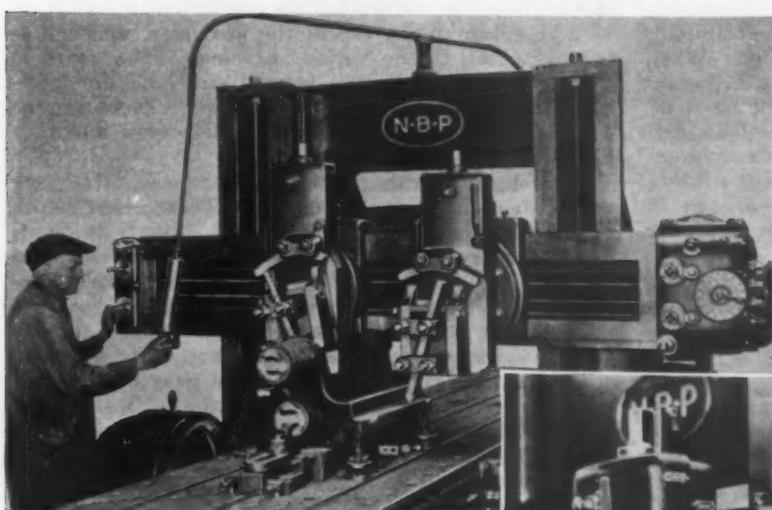


Fig. 3 (above)—Duplex Control Is Provided. Direction of the rail head motion may be controlled with the left hand, and the amount of motion by the right hand

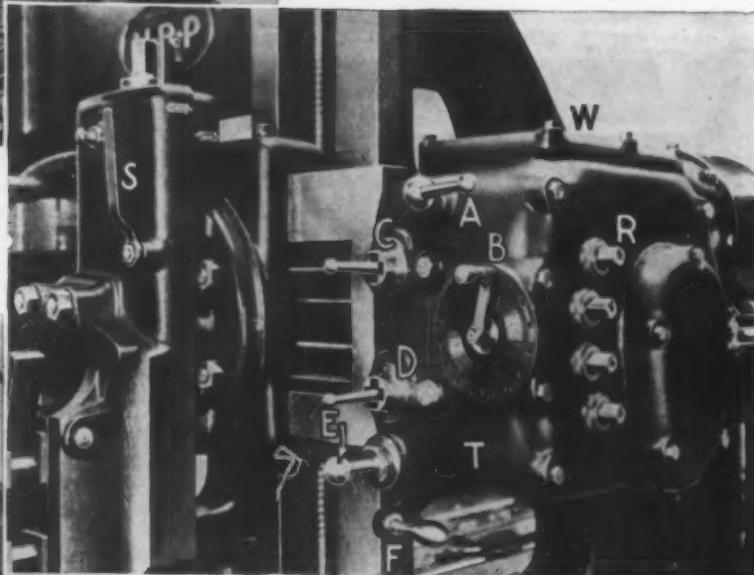


Fig. 2 (below)—Close-Up View of Rail. Lever A controls the direction of movement of the cross-rail, and the four-position levers C and D control the direction of the cross-rail heads and tool slides. Lever B controls the amount of feed to those heads

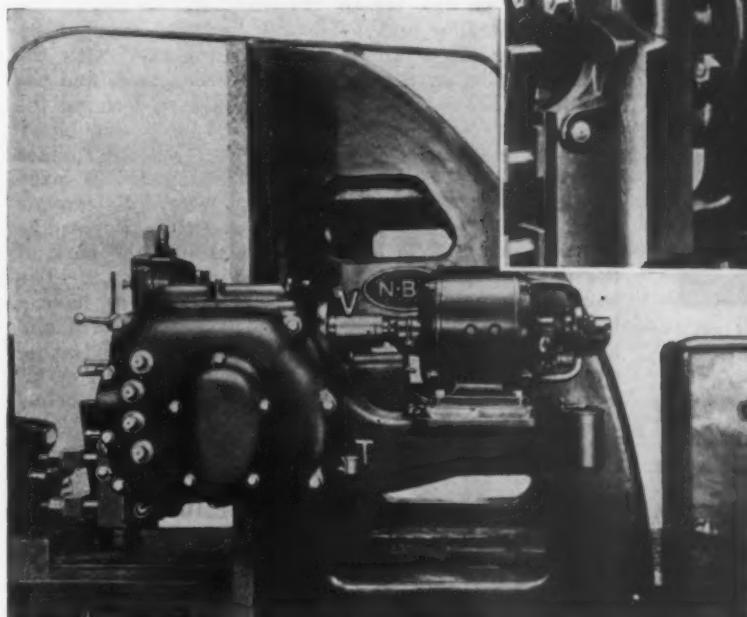


Fig. 4 (left)—Side View of Column and Rail Head Showing Mounting of Motor. The safety coupling is at V. The switch on the housing below the motor permits feeding at the end or at the beginning of the cutting stroke

the table and work would first be inched up to the tools by pulling the pendant to the second position and twisting the knob on and off. In setting the tool, the four-position lever, which controls the direction of motion of the head, is thrown in the direction that movement is desired, and the tool traversed quickly to the desired point by a twist of the knob in the first position down. As the tool nears the work, the knob would be twisted back and forth so that the tool would be inched and set to the exact position. In making the setting the operator can lean over the table and observe the exact setting of the tool, at the same time holding the pendant switch control in his hand.

Micrometer collars for each head, shown at R, Fig. 2, permit of accurately gaging the vertical distance traversed by the tool slides as well as the horizontal distance moved by the head along the cross-rail.

Placing the feed motor directly on the end of the rail has eliminated the various gears, shafts and brackets, with their bearings, employed in connecting the driving gears in the bed with the feed mechanism in the rail and side heads, when the power for feeding the heads is taken from the driving gears in the bed. It is pointed out that in taking the feed from the driving gears in the bed, the feed mechanism turns over with the driving gears and the amount of feed possible on short stroke work is therefore proportional to the

length of stroke of the table. An advantage claimed for the electric feed, is that while the rocker mechanism on the side of the bed is being thrown over to reverse the driving motor on the table the feed motor is simultaneously energized, and the feed takes place immediately. It is stated that in this way the time taken for the planer to reverse is utilized in feeding the heads, the maximum feed being secured even with the shortest stroke. Change in direction of feed is obtained by the single four-position levers, previously mentioned, the use of the springs and ratchets having been eliminated.

A feature of the machine is the arrangement for feeding either at the end of the cutting stroke or at the beginning of the stroke, as desired. The rocker on the side of the bed which is thrown by the table dogs, has been arranged so that it may be made to energize the feed motor either at the beginning or at the end of the cut stroke, merely by throwing the switch shown in Fig. 4 on the side of housing of the machine. The feed is positive and the amount of feed may be selected by direct-reading dials. These dials are arranged so that the side head feed may be varied independently from the rail head feed. The minimum feed is $1/64$ in. and increases by sixty-fourths to 1 in.

Rapid clamping of the cross-rail to the housings is another feature, the clamping being accomplished by means of lever F, Fig. 2. This clamping lever is keyed

to a clamping shaft extending along the cross-rail to the other side of the machine. A similar lever keyed to the other end of the shaft permits clamping the cross-rail from either side of the machine. When the clamping levers are moved back and forth, the action of a cam keyed at the center of the clamping shaft moves the steel plate *G*, Fig. 5, in and out. This steel plate transfers the clamping force to the ends of levers *H* and *K*, which have fulcrums at *L* and *N*, the levers clamping the cross-rail to the housings at *M* and *P*. The steel plate *G* is intended to equalize the clamping force on each housing.

The clamp may be adjusted simply by tightening or loosening up on the bolts *L* and *N*. The difference between the clamp fit and the sliding fit between the

end of the lubricator, *E*, there is a piston which takes the oil from the bottom of the casing and forces it up to a reservoir in the top of the box, from which it is led by tubing to the various bearings. The gears in the side head are of heat treated steel and are lubricated in the manner described above. There are no overhung gears in the gear box, all screws and rods having a double bearing.

The driving gears in the bed, and the table rack are of steel and of the Maag type. These gears run in oil and in addition have oil pumped directly to them. The driving gears are bronze bushed and rotate on fixed shafts. An oil pump in the bed furnishes forced lubrication to the table ways.

The gear box at the end of the rail has been arranged so that the cover may be removed and all parts made accessible for inspection. The gear box is split along the line *AT*, and by removing the bolts, the outer half of the box may be removed, making all the parts within the box conveniently accessible.

A safety coupling at *V*, Fig. 4, is intended to protect the machine against damage if the operator traverses or feeds the cross-rail heads together, if he traverses or feeds the side heads up against the cross-rail or if he lowers or elevates the cross-rail against any obstruction.

The cross-rail has been designed to resist the upward bending moment by providing the stiffening web *O*, Fig. 5, on the top of the rail, and to resist the torsional strains and backward bending moment by making the cross-rail deep. This, together with the cross-rail gibs on the outside of the housings, and the clamping gibs on the inside, are said to provide the cross-rail with the stiffness necessary for taking heavy roughing and accurate finishing cuts. The tool slides are wide and long to provide stiffness and also large bearing surface that will minimize wear. To provide a cross-rail saddle of maximum strength, the saddle has been made solid and extended around the back of the upper part of the rail, as shown in Fig. 2. The housings have a wide face to resist distortion, have a long bearing on the bed, and are bolted, doweled and keyed to the bed. The bed is of full length, and at no time does the table extend beyond it even at the maximum stroke. No part of the machine extends below the floor line.

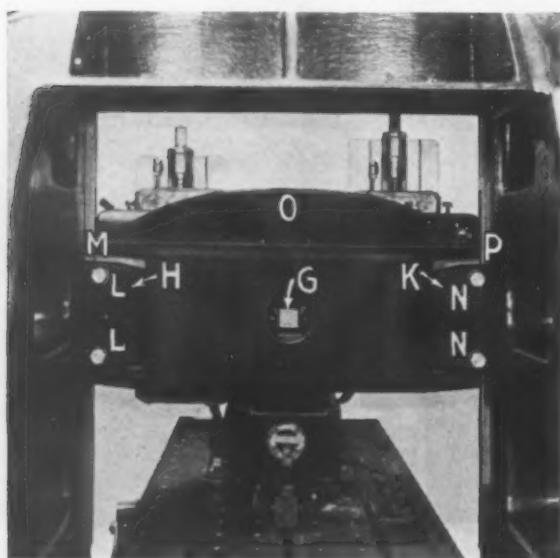


Fig. 5—View from Rear Showing Method of Clamping Rail

cross-rail and the housing is said to be a matter of 0.0015 in., the clamping on the housings being therefore roughly in proportion to the ratio between 0.0015 in. and the distance moved by the clamping lever. This ratio is stressed as providing a large advantage mechanically. The clamping levers *F*, Fig. 2, are interlocked with the elevating levers *A*.

The elevating screws are stationary, and are equipped with bronze rotating nuts held in the cross-rail. These nuts are rotated by worm gears meshed with a worm keyed to a horizontal shaft running across the cross-rail. This horizontal shaft may be rotated in either direction by manipulating the lever *A*, Fig. 2, the power being derived from the motor on the cross-rail. The cross-rail may be squared by adjusting nuts at the top of the housings. The elevating nuts operate on ball bearings.

The side head has been designed so that its tool may be brought up close to the cross-rail tool without any overhang on the cross-rail tool slide. To permit of this, the side head is offset, that is, the feeding and traversing driving mechanism are kept below the head. The side head tool has been brought up in line with the rail head tool, so that the table stroke for any job requiring the side head will not have to be increased a distance equal to the horizontal distance between the tools.

The same gears are used for traversing, feeding and elevating the cross-rails and are all contained in the gear box at the end of the cross-rail. These gears are of steel, heat treated and hardened. The gear box, shown in Fig. 4, is filled with oil at *T*. The two large gears which drive the small gears on each rod and screw are arranged so that they dip in oil and flood the entire box with oil. A "single shot lubricator," shown at *E*, Fig. 2, has also been provided. On the

Oil Well Equipment Companies Combine

LOS ANGELES, Oct. 27.—As a preliminary step in plans to construct a \$250,000 branch plant at Houston, Tex., incorporation papers have been filed for the merger of the Emsco Steel Products Co. and the Emsco Tool Co. into a new \$3,000,000 concern to be known as the Emsco Derrick & Equipment Co., according to an announcement by J. S. A. Smith, secretary-treasurer of the combination.

Both companies are active in export as well as domestic trade. The Emsco Steel Products Co. manufactures steel oil-well derricks and the Emsco Tool Co. produces all-steel oil-well equipment. The former firm has a capitalization of \$500,000 and the latter \$1,000,000, but the value of the property involved in the merger is said to be double this capitalization.

Construction of the new Houston plant will start about Jan. 1. Meanwhile, contract for the erection of a \$20,000 addition to the present machine shop of the Emsco Tool Co., 6911 South Alameda Street, Los Angeles, which will increase its capacity about one-third, has been awarded to the Union Iron Works, this city. Bids have also been awarded for the construction of a two-story office building to house the general offices of the new concern.

The two firms were established in 1923 with less than 100 employees and now employ more than 500 men. During the first nine months of 1925, 341 derricks were produced as compared with 71 in the corresponding period last year. Officers of the Emsco Derrick & Equipment Co. are: E. M. Smith, president; W. A. Trout and E. W. Goeser, vice-presidents, and J. S. A. Smith, secretary and treasurer.

Sykes Herringbone Gear Generator

Machines Now Being Placed on Market—Method of Cutting the Continuous Gears, and the Operation of the Equipment Explained

THREE years ago the Farrel Foundry & Machine Co., Buffalo, acquired the American and Canadian patents covering the Sykes gear generating machines. At the time the patents were acquired four gear cutting machines of various sizes to cover the whole range of herringbone gear requirements, were brought from England, these machines comprising the initial equipment for producing Sykes continuous herringbone gears in this country. Within two months after the installation of these machines the demand for their product became so large that the Farrel Foundry & Machine Co. decided to build and install an extensive equipment of Sykes gear generating machines. At the present time there are 15 of these machines in constant operation at the Buffalo plant, five of them, of the largest size, being employed in cutting gears up to 18 ft. in diameter.



Fig. 1—Pinion Type Cutters, Which Are Themselves Gears Having Teeth of Involute Contour, Are Used

But this equipment is not sufficient to meet the increasing demand for the gears. Some few months ago executives of the Farrel Foundry & Machine Co. made a survey of the probable future demand for Sykes herringbone gears, and as a result decided that it would be desirable to place some of these machines in localities remote from Buffalo, so as to deal more promptly with orders and thus give better service to those using or contemplating use of the gears. It was decided to install a machine first on the Pacific Coast, and as a result the Link Belt Meese-Gottfried Co., San Francisco, purchased a complete equipment to produce Sykes gears, and the whole range of gear reducing units, up to medium sizes which have been developed concurrently with the gear cutting machines. Subsequently the Foote Bros., Gear & Machine Co., Chicago, purchased a similar equipment, as previously noted in these columns.

Several large users of herringbone gears in various parts of the country have expressed a desire to install their own Sykes gear generating equipment, with the result that the Farrel Foundry & Machine Co. has now decided to put on the market the whole range of gear cutting machines.

The most interesting feature connected with the Sykes machines is the method of cutting the herringbone or double helical teeth, having the right- and left-hand portions of the teeth joined at the center of the face without any clearance whatever for the cutting

tools. Many users of these gears, and others who have inspected them, have been at a loss to understand how it is possible to machine the teeth in this manner. Like many apparently difficult shop operations, the production of the Sykes double helical continuous tooth gears is simple when it is seen, and although not easy to describe clearly the following illustrated description will, it is hoped, serve to explain how the teeth are cut sharp to a point.

The cutters used, shown in Fig. 1, are what are known as pinion type cutters, that is to say they are themselves gears having teeth of involute contour, just the same as the cutters used in the Fellows gear shaping machines. For cutting single helical and double helical gears it is of course necessary to use helical cutters. These cutters are mounted on one reciprocating carriage on the gear cutting machine with their end cutting faces facing each other.

As they reciprocate one cutter cuts when the travel is in one direction, and the other cuts when moving in the opposite direction. The construction of the machine insures that each cutter ends its stroke when its cutting edges are at the center of the face of the blank.

It may thus be assumed that when one cutter reaches the end of its cutting stroke it leaves a burr or chip, and that the other cutter when completing its working stroke removes this burr and leaves another one. This is actually what happens, but there is another interesting and important feature which makes this method successful. The cutters not only reciprocate and twist during their reciprocation so as to generate the helices, they also slowly revolve in unison with the wheel blank, thus generating the teeth contours. This generating feature results in finishing the apexes of the teeth in a perfect manner. It can be easily understood that if one cutter merely removed the burr left by the other cutter and in its turn left a burr, there would be some burr finally left. The generating action, however, of these cutters makes it impossible to leave any blemish provided the machine is properly adjusted, because as each cutting tooth slowly revolves out of engagement with the tooth space it has cut, it cuts a chip which tapers off to an infinitesimal thickness, and this has the effect of cleaning out the corners perfectly.

Improvements Made In the Sykes Machines

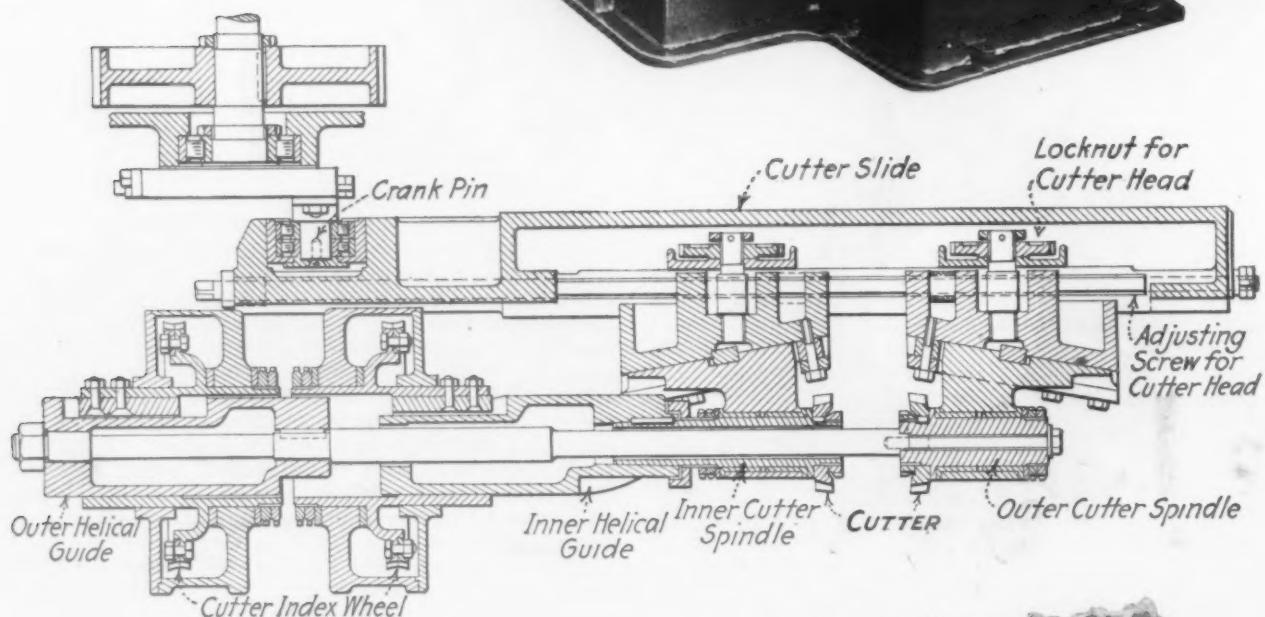
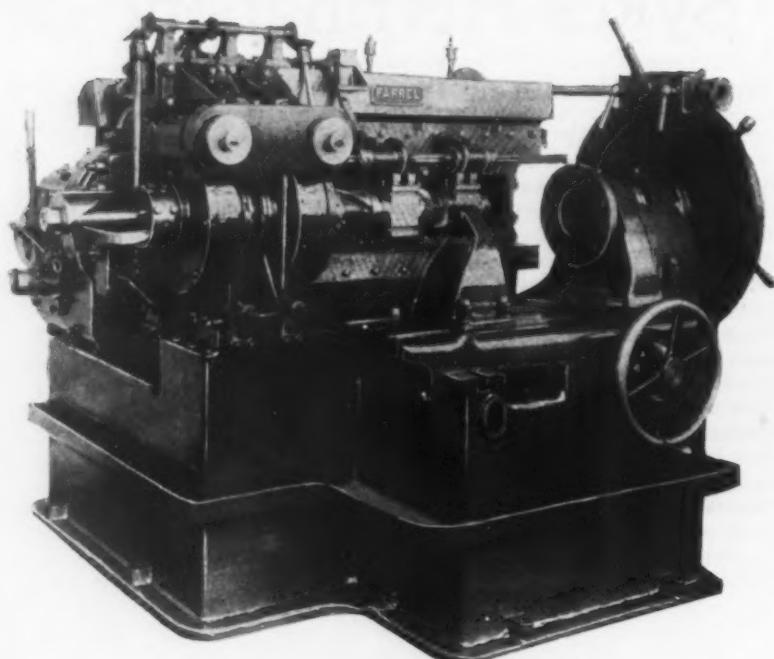
When the Farrel Foundry & Machine Co. commenced building these machines they were in a highly developed condition, nevertheless it was recognized that further developments would be needed. Arrangements were made for the inventor and designer of the machine, W. E. Sykes, to join the Farrel organization, and during the past three years a number of improvements have been made. The smallest size machine, known as the No. 1½, which is illustrated in Figs. 2 and 3, is representative of all the other sizes which have been built, except for the largest, known as No. 12. Machines now being built have a device for automatically controlling the tooth depth to be cut.

In the front view of the machine, Fig. 2, the cutters can be clearly seen. Fig. 3 is a rear view. In the latter view the driving pulley is shown, which is mounted on a shaft projecting from a four speed gear box. This gear box is made as a unit and mounted on one end of the machine. On the side of the gear box opposite to the driving pulley is the crank disk which serves to reciprocate the main sliding carriage or ram which carries the cutter brackets, as seen in Fig. 2. The four speeds provided by the gear box can be changed selectively by the levers shown in Fig. 3. All the gears in this gear box have Sykes herringbone teeth, with the exception of a pair of bevel gears which are arranged to connect a vertical shaft which projects at the top of the gear box, and serves to drive the generating

Fig. 2 (upper right)—Front View of the No. 1½ Sykes Gear Generator

Fig. 3 (lower right)—Rear View of the Same Machine, Showing the Speed Box and Drive Pulley

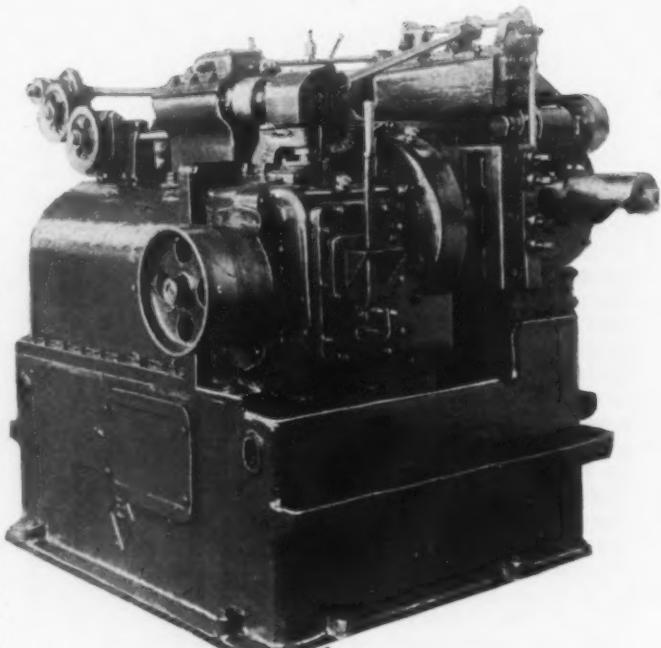
Fig. 4 (center)—Diagram of Cutter Controlling Mechanism



feed mechanism. It connects through bevel gears and a safety clutch to another smaller four-speed gear box which controls the rotating feed mechanism. It has two power outlets, one connecting to the cutter index worm wheels, and the other to the main index worm wheels. In the latter train of shaft and gear connections is interposed the only train of change gears in the machine. These are for giving the correct ratio between the cutter spindles and the main work spindle, and they thus provide means of varying this ratio in order to cut any desired number of teeth. The driver change wheel is arranged to have the same number of teeth as there are in each cutter, and the driven change wheel the number of teeth desired in the wheel blank to be cut, which provides a simple method for the determination of the proper change gear ratio.

Reciprocating Carriage Receives Harmonic Motion

The crank disk previously referred to is made integral with its shaft from a solid steel forging. It carries an adjustable steel crank pin so that the exact stroke required is easily obtained. The crank pin drives the main reciprocating carriage through a square block engaging in a vertical slot, and thus the reciprocating carriage receives a pure harmonic motion causing the cutters to decelerate uniformly from the middle of the stroke to the end of the stroke. This is important because it is necessary that the cutters stop positively and without jar at the center of the face of the wheel blank.



The cutters are carried on case-hardened steel spindles which are accurately ground and lapped. The bearings which carry these spindles are also of case-hardened steel, and are fitted accurately both on the journals and end faces. The spindles and bearings are

lapped together to provide minimum running clearance and a perfect bearing surface. The brackets or heads carrying these cutter spindles are each provided with flanged bases, which are machined and surfaced to fit into guides formed in saddles in turn fitted in guides on the main reciprocating carriage. The guides formed by the flanged bases of the cutter head brackets and saddles have their engaging surfaces at an angle with the axis of the cutter spindles. This is part of the relieving mechanism which has the function of withdrawing each cutter from the wheel blank prior to the commencement of the return stroke. The angularity of the guides, combined with the movement longitudinally of the saddle, relative to the bracket causes the latter to have a movement at right angles to the axis of the cutter spindles. The correct amount of movement is governed by stops fixed at the end of the aforementioned guides, and the movement is engendered by the reciprocation of the main reciprocating carriage in conjunction with a movement imparted by some rotating cams operating on cam rollers. These can be seen in the front view of the machine, Fig. 2.

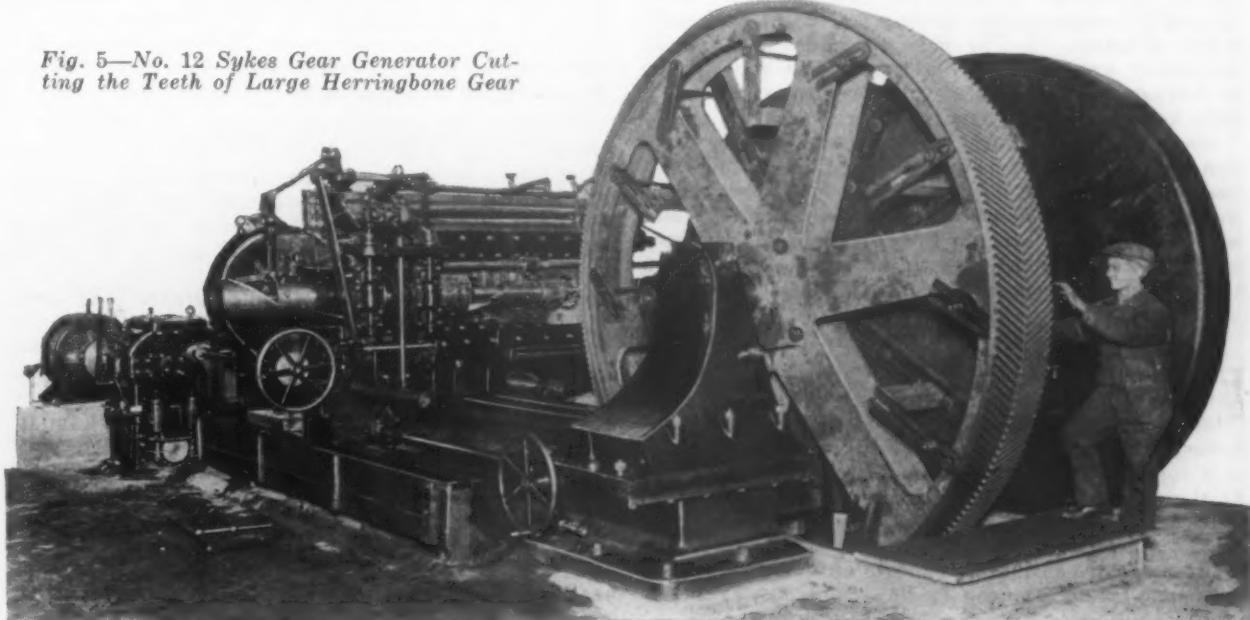
It will be observed that in the relieving motion each cutter must have independent movement because while one cutter is withdrawing from the work, the other cutter must be approaching the work. Actually each

of adjusting the position of the cutters relative to the wheel blank, and further provides precise adjustment of the position of the cutters at the reversal of their cutting strokes, thus producing finished tooth apices of accurate contour.

Cutters Adjustable In Circular Direction

There is one other important adjustment necessary. It is obvious that the cutters must be adjusted in a circular direction so as to get the teeth in each cutter directly opposite the teeth in the other cutter to insure accurate registry at the center of the wheel face. This adjustment is obtained by declutching the gears connecting the two cutter index worms, thus permitting either of these worms to be turned by hand independently of the other. The connection and disconnection is made by finely serrated clutch teeth which are cut in rings of large diameter. These clutch teeth being on the worm shaft provide very fine adjustment of the cutters because of the large ratios of the cutter index worm gear. Each cutter may be adjusted to a limit as fine as 0.0001 in., and the adjustment may be made while the machine is running, in fact, it is desirable to make it only when the machine is running. The actual gaging of the gears, both for tooth thickness, tooth depth, and for position of the apex of the

Fig. 5—No. 12 Sykes Gear Generator Cutting the Teeth of Large Herringbone Gear



cutter bracket is independent of the other except that it receives its reciprocating motion from the main reciprocating carriage. Each cutter receives its twisting motion, necessary to obtain the helical trace of the cutter teeth, from helical guides which can be observed in the two front views. The cutter farthest away from the cutter index gears and nearest to the main index wheel, is controlled so far as its twisting and rotating movements are concerned, by the cutter index gear farthest away from it. This requires the shaft connecting this particular cutter spindle with its helical guide to pass through the other cutter spindle and the other helical guide. Therefore the cutter spindle to the left in the front view is hollow and connects to the helical guide nearest to it.

The housings containing the cutter index worm wheels must move at right angles to the axis of the worm wheels so as to keep in true alignment with the cutters during the relieving motion. This is only a very slight movement and it is controlled by the same mechanism that operates the cams on the cutter brackets. In order to make the whole of this cutter controlling mechanism clear the diagram, Fig. 4, has been prepared.

The saddles which carry the cutter brackets on the reciprocating carriage are made adjustable in a manner similar to the tool boxes on the cross rail of a planing machine. This construction provides means

teeth, is done by the simplest possible means after the machine is put into operation. A description of the actual gaging operations does not come within the scope of this article.

The large hand wheel shown in the foreground of the front view, Fig. 2, moves the work-carrying saddle toward or away from the cutters. It also serves to determine the depth the teeth are to be cut. This hand wheel will be controlled automatically in the machines at present under construction, the illustrations do not show this particular controlling mechanism. It is designed to feed the work toward the cutters and to stop when the depth is obtained. With this mechanism the machines are entirely automatic. It is only intended however, to fit this automatic depth feed mechanism to the smaller sizes of machines as it is not considered necessary for the larger machines, which are seldom engaged on repetition work.

Large Machine Different In Details

The large size machine, shown in Fig. 5, is, in principle, the same as the smaller unit described above, but in detail the design is quite different. The reason for this is that the gears cut on the large machines are much heavier than that part of the machine carrying

(Concluded on page 1225)

Steam Coal Plentiful; Anthracite Strike Causing Some Concern About Coke

Use for Domestic Fuel Puts Up Spot Market and Suggests Possible Effect on Pig Iron Prices Early Next Year

BY DR. LEWIS H. HANEY
DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

THE facts about the statistical position of bituminous coal are as follows: 1. Production is increasing and the total for September was the largest for the season in recent years. For the week of Oct. 10 the bituminous output was estimated at 11,696,000 tons, the largest for any week since January. 2. Stocks of bituminous coal held by industries have increased and are considerably larger than those of last year. Evidently industrial users have fortified themselves against the contingencies arising out of the anthracite strike situation. 3. The price of bituminous coal in September averaged \$2.17 a ton against \$2.04 a ton in August. At the middle of October the price was a little lower, averaging about \$2.13 a ton.

In September, a flurry due to the anthracite situation and lower temperature resulted in putting soft coal prices up rather sharply. Early in October milder weather put them down again. More recently colder weather has again brought greater strength. Evidently it is a weather market, with the anthracite situation a factor in the case of the domestic sizes.

Plenty of Steam Coal

In fact, in the case of steam coal there is little reason for any considerable increase in price in the near future. Anthracite coal is almost entirely used for domestic heating and the demand for bituminous coal as a substitute is, therefore, limited to domestic sizes. At the same time, the increased production of bituminous coal results in an accumulation of the steam sizes. On the other hand, the activity of industry is not expanding rapidly enough to indicate any sharp increase in demand for screenings. In New England steam coal

users are reported "indifferent" and in southern Illinois the mines are having trouble in moving steam coal. It is a buyers' market for industrial grades.

The trend of coal prices is hardly to be forecast on an ordinary economic basis. Severe weather and a prolonging of the strike would undoubtedly cause further gains in domestic sizes. It should be remembered that normally the quantity of anthracite coal marketed is only about one-sixth of the production of bituminous coal and that the capacity of the bituminous mines is very great. Thus there seems to be no danger of a runaway market in domestic sizes and only moderate firmness is to be expected in the steam sizes.

Unusual Coke Situation

As shown in Fig. 2 both the production and the price of coke have held up better than bituminous coal during the last two years. At present coke production shows only a moderate gain and prices are rising sharply.

The spot price of Connellsburg furnace coke averaged \$3.49 in September against \$3.06 in August. In the week of Oct. 13 it reached \$5 and last week was quoted at \$7.50. The price of coke seems likely to go still higher. The demand for steel-making purposes is increasing with the growing activity in that industry, and the demand as a substitute for anthracite coal is strong. Recently the buying for the latter purpose has been rather excited. Marketers of domestic fuel have become active in buying run-of-oven blast furnace coke at Connellsburg. While most iron and steel producers appear to be covered for the balance of the year, uncertainty of the duration of the anthracite strike

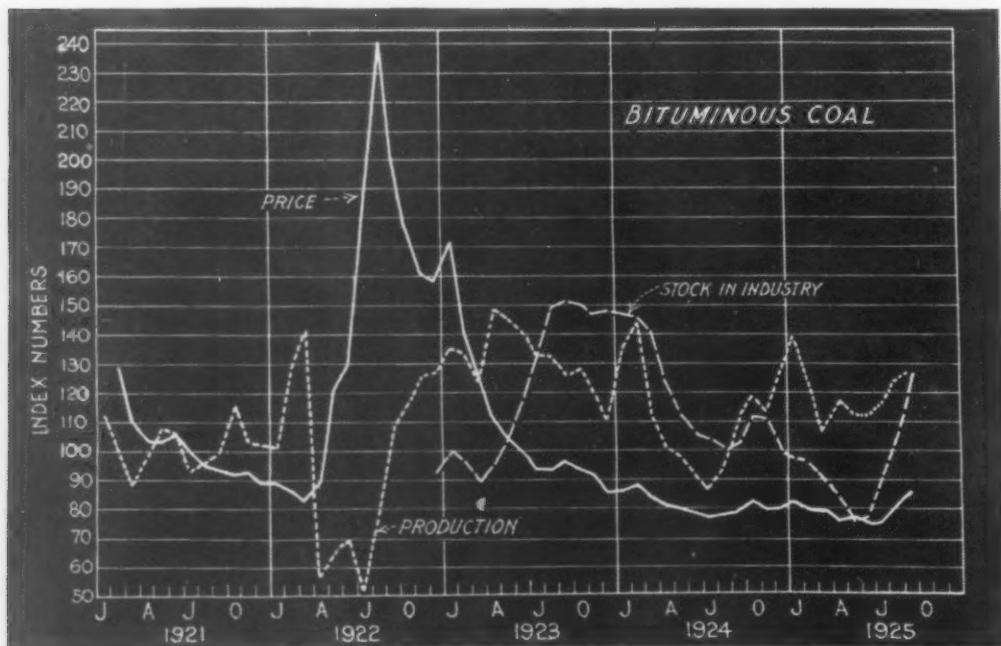


Fig. 1—Increased Production of Bituminous Coal Offsets the Anthracite Shortage to Some Extent. Stocks of steam coal also are large

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The Iron Age and Its Readers

DR. MOLDENKE, in his interesting analysis of the gray iron foundry situation in this issue, makes two suggestions to the owners and operators of such plants. He recommends that purchasing agents be thoroughly informed as to what the gray iron foundry can produce and that producing foundrymen be thoroughly informed as to the methods and equipment best calculated to make good castings.

Advocacy of a particular product as against another is no part of the editorial function, but pointing out the path by which costs can be lowered through improved methods and equipment is a service to which THE IRON AGE attaches much importance.

Regular reading of the articles on production-methods will greatly aid foundrymen who desire to follow up Dr. Moldenke's second suggestion.

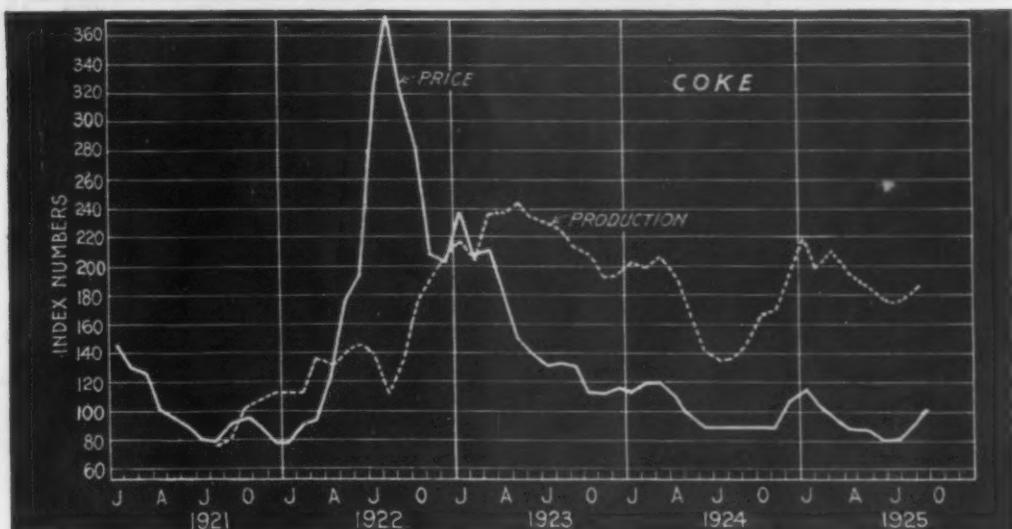


Fig. 2—The Increase in Spot Market Prices of Coke Are Causing Some Concern to Contract Buyers Who Have Not Fully Covered Requirements

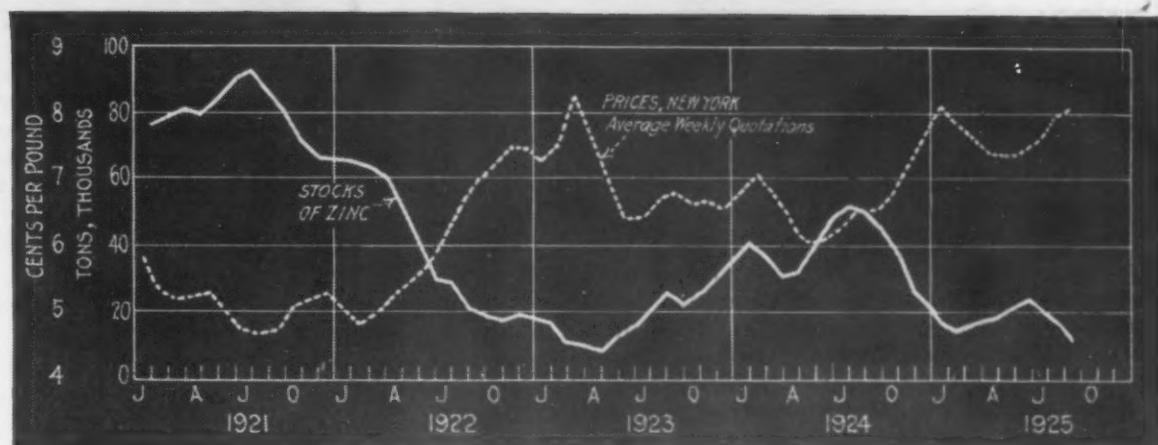


Fig. 3—Stocks of Zinc Are Now Nearly at Bottom Levels and Further Price Increases Are Doubtful

makes it possible that an advancing coke market may become a more important factor in the price of pig iron.

Zinc Prices Still Climb

STOCKS of zinc are unusually small. Domestic stocks are very low—only a little larger than in April, 1923. Foreign supplies are also reported to be small, and European consumers have been active in bidding for the market output.

As shown in Fig. 3 the price of zinc has been climbing steadily and on Oct. 22 the New York delivery reached 8.72c.

It seems probable that zinc prices will go even a little higher. The demand continues strong; production does not yet show any such excessive peak as in early 1923; stocks are extraordinarily low and not likely to increase for another month or two. It should be noted, however, that the number of retorts is large and increasing and the number of plants operating in the Tri-State area of the Middle West is the largest on record. It does not seem reasonable to suppose that any further increase in price can be large. Stocks are now nearly at bottom levels and, judging by the past, when an increase in stocks comes it will be attended by lower prices.

The Iron Age, October 29, 1925

New Record in Motor Trucks

September production of motor trucks, according to the Department of Commerce, amounted to 60,363 trucks, of which 57,883 were made in the United States and 2480 in Canada on American designs. This is the largest production of motor trucks in any month since the monthly figures have been published. The previous high record was that of April of this year, with 47,823 trucks. Truck production in the first nine months of 1925, at 376,678, is almost exactly equal to the 12 months of 1924, with 377,344. It is higher than the 12 months of 1923, which gave 376,129, and is far above the entire year's production in any previous year.

Passenger car production in September was 272,396, a considerable increase over the August figure (revised) of 221,813, but otherwise much lower than in any month since February. The low August figure was due to the change in the Ford model. The present figure compares with 263,528 in September last year. For nine months this year the total has been 2,789,463, compared with 2,615,441 in nine months last year, and with 2,741,387 in the first nine months of 1923—the year which made the high record in total production.

It appears possible from these figures that a new high record in production may be obtained this year. The nine-month total for cars and trucks is 3,166,141, compared with 3,031,537 in 1923.

Wholesale Prices Lower

A slight reduction was reported for September by the United States Bureau of Labor Statistics in its analysis of wholesale commodity prices. Based on 1913 as 100, the September figure is given as 159.7, compared with 160.4 in August, both figures being well above the 148.8 for September, 1924.

Metals and metal products at 127.2 show the lowest level for any of the nine groups making up the total. The metals have fallen from 128.2 a year ago, while all other groups, except housefurnishing goods, have risen, and the general average has increased by 7 per cent. Among the major items which are still more than double the 1913 price are housefurnishings, brick, anthracite and bituminous coal and woolen and worsted goods. Non-ferrous metals at 113.1 represent one of the lowest groups, iron and steel standing at 133.7.

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Steel Trade Cooperation

FOUR particularly arresting sentences in Judge Gary's presidential address at Friday night's dinner of the American Iron and Steel Institute were these:

As a suggestion for consideration by the iron and steel industry, which is large and influential, would it be advisable to make another effort to stabilize the business? Suppose the Department of Justice would be willing to participate. If meetings should occasionally be held by the manufacturers for the discussion of business on the lines pursued in 1907 and a representative of the Department of Justice should be designated by the Attorney-General to attend and listen and, whenever necessary and appropriate, to advise concerning the law, what would be the effect upon the steel business, and perhaps other lines? Possibly this could be accomplished.

This suggestion, very guardedly made in the form of questions that are not answered, can scarcely be called advocacy of a return to the Gary dinner regime, though it has been so described in various newspaper headlines and editorials. In the address, it follows a series of quotations from remarks made by Judge Gary at the steel trade dinner of Dec. 10, 1908, these alternating with extracts from the Supreme Court decision of last June in the Maple Flooring and Cement association cases. Judge Gary's purpose, as he explained, was to show that his expressions in December, 1908, as to what, in view of the Sherman Act, competitors might legally say and do when they came together in business conferences, were in harmony with what the Supreme Court laid down, in its decision of last June, regarding legal and proper activities of trade associations. The most striking agreement in the two utterances is seen in the quotations below:

As I understand, it is not improper for competitors to meet and without reserve furnish full information and express opinions concerning the business affairs of all, provided they are not acting under an agreement, express or implied. It is not wrong, even though any or all may be influenced regarding any particular business, nor even though the result may be to prevent radical and unreasonable changes in prices.—*Judge Gary's Address of 1908.*

It is not open to question that the dissemination of

pertinent information concerning any trade or business tends to stabilize that trade or business and to produce uniformity of price and trade practice. . . . Its consequent effect in stabilizing production and price can hardly be deemed a restraint of commerce, or, if so, it cannot, we think, be said to be an unreasonable restraint, or in any respect unlawful.—*Supreme Court Decision of June 1, 1925.*

Striking proof of the evolution in Supreme Court interpretation of the Sherman Act is the fact that in both the Trenton decision of June 3, 1915, and the Supreme Court decision of March 1, 1920, refusing the Government petition for the dissolution of the Steel Corporation, the head and front of the Steel Corporation's offending was its initiation of and participation in the Gary dinners. In fact, the Circuit Court of Appeals at Trenton took pains to say that "we will, if the Government moves for such action, retain the bill for the purpose of restraining any similar movement by the defendants that might be contemplated hereafter."

Further, both the lower court and the Supreme Court decisions in the dissolution case made much of the fact that the Gary dinner conferences had been abandoned several months before the suit was brought. The four justices who concurred in the majority finding of the Supreme Court expressed the opinion that "the practices were abandoned from a conviction of their futility." However, Judge Gary's Friday night address seems to point to the Stanley committee inquiry as the cause. Referring to the introduction of the Stanley resolution for a Congressional investigation in the spring of 1911, he adds: "Whereupon the movement for stabilization was immediately and permanently abandoned."

Judge Gary's chief purpose, in throwing out the thought of a revival of steel trade conferences, may have been to give a new emphasis to the fact that the producers of steel "have carried competition to the point of accepting unreasonably low prices," also to the possible complaint of "some of you" that "taking into account the larger investment of capital by reason of extra cost of construction [in recent years] and otherwise, there has not been a fair and reasonable return in profits."

There is abundant evidence, as pointed out in

these columns from time to time, that the great problem of the steel industry, under present competitive conditions, is that of securing a reasonable profit for investors in its securities. Whether that end would be attained through price stabilization is a question on which the Government and public are not likely to see eye to eye with the leaders of the industry. The possibility of any Department of Justice cooperation with a stabilizing movement is remote; and if there were such participation, it is not difficult to imagine the reaction—and action—of the farming community, to mention one great body of producers whose profits are subject to the caprice of nature and to varying world demand.

The steel industry—and all industry—has much ground for satisfaction in the increasing reasonableness of the Government's attitude toward business as expressed by its judicial and executive departments. Is not the remedy for the present untoward conditions largely within the reach of the producers themselves, without further aid of Federal authority? Closely read, Judge Gary's institute address may fairly be said to make that its main preaching.

High-Grade Converter Castings

IN recent years the possibility of making high-grade castings in the side-blow converter has been a live issue among steel foundrymen. On the one hand it has been argued that first class steel cannot be secured because of sulphur, oxidizing effects and other conditions. Advocates of the converter emphasize its flexibility and its high temperature possibilities. But the plain trend has been away from the converter and the electric furnace has been slowly replacing it.

That first grade castings can be made from converter steel was well demonstrated in a paper on "Carbon Steel and Carbon-Vanadium Steel in the Converter," read at the recent Syracuse convention of foundrymen and abstracted in THE IRON AGE, Oct. 15. A Michigan foundry has solved one problem by resorting to the desulphurizing compounds that are a development of the past few years. The use of not less than 0.75 per cent of manganese in the steel has also been very beneficial—a practice many are now recognizing as of great importance. The result of the care taken in these two respects has been the production of carbon and alloy steel castings which compare favorably in physical and other properties with the electric furnace product.

Undoubtedly the converter has its field, particularly in locations having advantages as to fuel and raw materials. With the employment of the methods that have worked so well in the Michigan foundry, it might indeed come to take a new place as an effective vehicle of the steel foundry.

BUSINESS confidence is a prime factor in prosperity. Therefore, when some 50,000 questionnaires returned to the National Association of Manufacturers show unmistakable evidence of confidence in the months ahead, it is a very encouraging indication. It does not appear how many queries were sent to members of the iron and steel trades, but of those who replied 13 per

cent view the winter outlook as excellent, 55 per cent call it good and 23 per cent regard it as fair. An improvement over last fall is reported by 57 per cent, and only 12 per cent think that business has been less profitable than a year ago. An increase in employment since last fall is mentioned by 70 per cent; only 4 per cent show a smaller number of men on the payroll. Higher wages than in 1924 are reported by 83 per cent; only 5 per cent show any measurable reduction.

Anthracite Substitutes

DESPITE the strike in the anthracite regions, which has cut the production there to 44,000 tons for the first three weeks of October, compared with 4,912,000 tons in the same period last year, the output of bituminous coal is much below the rate of years of activity and only 10 per cent ahead of the average of three recent years of depression. While larger than last year—34,456,000 tons in the first three weeks of October against 32,117,000 tons in 1924—the bituminous total for the calendar year up to Oct. 17 has been only 394,801,000 tons, compared with an average of 454,909,000 tons in the like periods of 1918, 1920 and 1923, which, like 1925, were years of more than average activity. Less active years, such as 1919, 1921 and 1924, showed an average of 359,042,000 tons up to Oct. 17.

Sales of oil-burning and gas-burning equipment all over the eastern half of the United States have grown rapidly, with the development of satisfactory devices for handling these fuels on a domestic and small power basis. Several of these designs have the approval of the Underwriters' Laboratories, which makes them standard for use almost anywhere. City gas, in spite of its higher cost, is being adopted in many instances because of its easy control, absence of standby losses, and perfect freedom from the dust, ashes and other disagreeable features inseparable from the use of coal, both anthracite and bituminous.

It remains to be seen whether the growing uneasiness of the anthracite miners is due more to inroads upon their savings or to the realization that their strike policy is only slow suicide in cutting off the very markets upon which they have been accustomed to depend.

Steel Making and Finishing Capacity

ATTENTION should be directed to the fact that a state of unbalance in the steel trade that existed at the close of the war has been corrected in the seven years intervening. The pre-war relation between steel producing and steel finishing capacity has been fully restored. During the war there was much more construction of steel making than of steel finishing capacity.

In all the period before the war, since the steel industry became well alined after the supplanting of wrought iron, it was the fairly uniform condition that the total capacity for rolling and otherwise finishing steel was quite in excess of the capacity for producing steel ingots. This was necessary in the individual plant of any size, making a

variety of products, and it was necessary in the steel industry as a whole, because rolling mills are highly specialized and the character of demand changes from time to time, not being distributed in unalterable proportions to the different finished products, as rails, bars, shapes, plates, wire. The heaviest investments are those in the facilities up through the ingot, and it would be awkward for the finishing mills all to be filled with orders, in their various lines, but with not enough ingots to keep them going.

Estimates were sometimes made before the war that the difference between steel making and steel finishing capacity was 15 to 20 per cent. That is, if steel ingot production was at capacity, the finishing mills would average some 15 per cent less tonnage than they were capable of handling. There were no statistics, but light was often thrown on the subject by a given finishing department not being allotted so much steel as it wanted, because steel was likewise wanted by other finishing departments.

The war upset this situation. It called for much steel in which there was very heavy cropping of the ingot; in fact, some of the steel was forged and never rolled at all. Accordingly there was much more construction for the production of ingots than for rolling ingots and finishing the steel, and by the close of the war the old-time leeway of perhaps 15 or 20 per cent had been entirely destroyed or greatly reduced.

In the seven years since the war there has not been a great deal of outright new construction in finishing lines, but there has been some, and there has been a great deal of rehabilitation, various minor improvements having been made. But the amount of new construction, leading to the production of ingots has been quite insignificant, particularly in comparison with that before and during the war.

In some quarters it is estimated that there is at the present time even a greater excess of finishing capacity, or a greater deficiency in ingot producing capacity, than existed before the war.

The result of this progressive change since the war is that the steel industry is more active at any given time than a scrutiny of performance in its finishing lines would suggest. The ingot is the steel unit and the trade must be judged by that. To put it in another way, there may be a condition in which any one of half a dozen finishing lines could increase its operation by one-third; but not all could do so at the same time, because there would not be enough ingot steel.

NOTABLE among European steel developments has been the expansion in the steel export volume of France, particularly this year. To Aug. 1, French iron and steel exports were 289,700 tons per month compared with 231,100 tons per month in 1924, an increase of over 25 per cent. In 1920 the monthly average was only 77,400 tons. Comparing with pre-war records, the present rate is nearly seven times the monthly average of 46,500 tons for 1912 and 1913. France before the war was scarcely reckoned among steel exporting nations, being outranked by Germany, Great Britain, United States and Belgium, standing in the order named. Today

only Great Britain has a greater outbound trade in iron and steel and the French movement has been more than twice that from the United States thus far in 1925.

Rail Tonnages for Replacements

FOR nearly two months the annual rail-buying movement has been in progress and the tonnages have been running rather large. The question may be asked whether rails are wearing out faster nowadays in proportion to the increased duty upon them, for the statistics of freight movement show consistent gains in ton-miles, though not at so rapid a pace as in the past. Statistics up to the war indicated a fairly uniform rule that the total freight ton-mileage tended to double every 12 years.

In more recent time the rate of increase in ton-mileage seems to have dropped, though still very substantial. The decline in the rate may be ascribed to the country having grown up to the use of railroad facilities (for in any new thing there is at first an especially high rate of increase), also to the use of motor trucking, and perhaps to changes in industrial alignments whereby long hauls constitute a smaller proportion of the total movement than formerly.

The tonnage of rails used for replacement, however, is not a precise index to the number of miles of track on which rails are relaid. The section of rail has been increasing, so that many more tons are laid than are taken up.

In THE IRON AGE of Oct. 24, 1912, it was estimated on the basis of some information collected by one of the railroad associations that the 240,000 miles of main line steam railroad track in the United States at that time were laid with rails of an average section of 75 pounds per yard; also it was assumed that 110,000 miles of secondary track had an average weight of 65 pounds.

We may take it that the steam railroad track of 13 years ago had an average weight less than 75 pounds per yard. To change that length of track from 75 pounds to 100 pounds would involve, as a matter of arithmetical computation, close to 14,000,000 tons of rails. Statistics of recent years have indicated that the replacements run somewhere between 1,500,000 and 2,000,000 tons a year, and from the computation made it can be seen that a very considerable proportion of the rails purchased for replacement purposes involves an increase in the section. The tonnage of rails taken up is considerably smaller than the tonnage laid.

Rails have been improving in quality, and improvements are not at an end. As quality improves the rails will bear more traffic and the number of miles replaced per annum will not increase so rapidly as does the total ton-mileage; but it will be a long time before the replacements merely run even with the current wear. Each year for a long while rails will be taken up which have not given as good service as the rails replacing them are fitted to furnish.

This replacing is of course only one item in the total demand upon the rail mills. A large tonnage of rails is used by the industries and by electric lines, and varying tonnages are exported.

WAYS OF SELLING SCRAP

"The Iron Age" Answers Inquiry as to Methods of Selling Old Material

THE IRON AGE has recently answered the inquiry of a large manufacturing company as to the best method of selling its scrap accumulation. The subject is of such interest to all manufacturers that we quote as follows from our letter:

"Your question as to the best method of disposing of a manufacturer's accumulation of scrap iron and steel, whether by auction sale, sealed bids or on a sliding scale contract based on trade paper quotations, is of such interest that we have taken time to inquire among the trade as to the experiences of other manufacturers.

"If you have sufficient storage facilities to store your scrap for considerable periods, obviously it would be to your advantage to do this and sell your material whenever prices are at their peak. In such a case either an auction sale or a sale by sealed bids would prove effective. When prices are high both mills and dealers are anxious to buy and you would have little difficulty in getting the top of the market.

"We assume, however, that, like many manufacturers, you haven't sufficient storage space to permit you to hold your scrap for the peak price movements, but that you must ship your accumulations from time to time to make room for the scrap production of your plant. If it is your practice to ship your scrap continuously, the auction sale or sealed bid method would entail a great deal of clerical work in your office which might make it an unprofitable undertaking.

"Upon investigation we find that some manufacturers object to the auction method on the ground that it offers an opportunity for bidders to "put their heads together" and agree upon a limit price that shall be paid. Where there are only four or five bidders they can easily agree upon a price and divide up the scrap according to a prearranged plan. There seems to be little question that this has occasionally been done and the manufacturer who thus disposes of his scrap is the loser.

"The sealed bid method is the one followed by most of the railroads of the country, and the fact that the railroads usually get the top of the market for their scrap is a very fair indication that they have found this method the most successful. Scrap brokers tell us that they prefer to put in sealed bids rather than bid openly at an auction, as they do not always desire their competitors to know what they are doing. There is, as you know, a great deal of speculative buying of scrap, and those engaging in it frequently want to cover up their activities. Some manufacturers have abandoned the sealed bid method of selling scrap, however, because the clerical work involved is too great for the relatively small quantity of material to be disposed of each month.

"Trade paper quotations are widely used for basing scrap contracts. THE IRON AGE has never urged this method and does not do so now, but the testimony of both buyers and sellers of scrap with whom we have talked since receiving your letter is to the effect that in many cases the only thoroughly equitable way of buying and selling scrap is on a sliding scale that gives both parties the benefit of "breaks" in the market. Market quotations, as published by THE IRON AGE, afford a means of basing such contracts. For many years it has been the custom of manufacturers of iron carwheels to take back old wheels from the railroads in exchange for new. As old iron carwheels have a definite scrap value they are quoted in the trade papers, and the carwheel makers have for years used this scrap value as a settling basis with the railroads for their old wheels. We have yet to hear a complaint that this method has not proved mutually equitable. One of the large steel companies says that contracts based on trade papers' quotations have proved "mutually advantageous" to both buyer and seller, and its own contracts involve tens of thousands of dollars every month.

"Unfortunately, there is no written material in the form of books or articles that bears on this subject, and what we have tried to give you is the experience of the trade as we have learned of it. We hope that this letter may be helpful to you in arriving at a profitable conclusion."

CORRESPONDENCE

Uniform Invoice Forms

To the Editor: In your Oct. 22 issue the writer notices your article regarding uniform invoice forms.

An incident has just come to our attention which we believe would be interesting to you in this connection, as relating to the arrangement of such a form. One of the concerns from which we buy material uses an invoice where "Sold to" and "Shipped to" are arranged one above the other, with the result that when the mail clerk inclosed the invoice in a window envelope the invoice was found to be addressed to the consignee instead of the purchaser. As you know, many companies buy goods for shipment direct to their customers, and in the case in question the shipper was kind enough to send the invoice, although unintentionally, to the purchaser's customer. This of course is apt to prove embarrassing, as the customer would then know the cost price of the article sold to him.

The writer would suggest that to obviate such difficulty any invoice or shipping form should have the space for the name of the purchaser and the name of the consignee arranged in such a manner on the form that there can be no chance of its getting into the hands of the wrong party.

A. B. ZAHN,
F. L. Smith & Co.

New York, Oct. 23.

The United States Electrical Tool Co., Cincinnati, has arranged with Westinghouse service stations located in 28 cities in the country to provide for service on the portable electric tools made by the company.

Southern and New York Central Rail Orders

Among rail orders distributed in the current week are those of the Southern Railway amounting to 46,200 tons, and the New York Central Lines totaling 206,745 tons.

The Southern order was distributed as follows: 39,200 to the Tennessee Coal, Iron & Railroad Co., 5000 tons to the Bethlehem Steel Co., and 2000 tons to the Illinois Steel Co.

Of the New York Central order, 75 per cent of the total has been definitely specified against, leaving the remainder on option. Thus the actual rail specifications issued for rollings beginning in November amount to 155,000 tons, distributed as follows: 66,300 to the Bethlehem Steel Co., 60,300 to the Illinois Steel Co., 14,100 to the Carnegie Steel Co. and 14,300 tons to the Inland Steel Co. Including the option, the total amount of rails which each company may supply is one-third greater, being thus 88,500, 80,445, 18,800 and 19,000 tons for the Bethlehem, Illinois, Carnegie and Inland companies, respectively. Rails of 105, 115, and 127 lb. per yard are covered in the distribution.

Mechanical stokers sold in September are reported by the Department of Commerce at 119 units, aggregating 38,155 hp. This is a substantial gain over the low figures of August at 91 units and 29,865 hp., and a still better gain over the September figures of 1924, which were 73 units and 25,988 hp. Except for August and January, however, the current total is the lowest of the year and is not much over half the March figure of 71,090 hp.

Steel Corporation Earnings Gain

But Some Mills Earn Less Than in Second Quarter
—Profit Regarded Small Considering
Business Volume

THE third-quarter earnings of the United States Steel Corporation were \$42,400,412, a gain of \$1,776,000 over the previous quarter and of \$11,682,000 over the same period a year ago. Several other steel companies also showed larger earnings for the last three months than for the second quarter, notably Republic Iron & Steel Co., but there were also some concerns which failed to show earnings as large as for the second quarter, despite the large volume of business done.

The Steel Corporation's surplus for the quarter, after paying the regular 1% per cent preferred dividend, the regular 1 1/4 per cent common dividend, plus an extra 1/2 per cent common declaration (this is the ninth consecutive extra dividend thus declared) amounted to \$8,604,611. The first quarter surplus was \$6,005,079, that of the second quarter \$6,688,792. Earnings for the third quarter were the highest for any like period since the first quarter of 1924.

Earnings of the United States Steel Corporation for three years and for the quarter just ended were as follows:

Quarters	1925	1924	1923	1922
First	\$39,882,992	\$50,075,445	\$34,780,069	\$19,339,985
Second	40,624,221	41,381,039	47,858,181	27,286,945
Third	42,400,412	30,718,415	47,053,680	27,468,339
Fourth	.....	30,762,231	49,958,980	27,552,392

EARNINGS FOR THIRD QUARTER, 1925

	Earnings Before Charging Interest on the Subsidiary Companies' Bonds Outstanding	Less: Interest on the Subsidiary Companies' Bonds Outstanding	Balance of Earnings	
July, 1925	\$14,616,529	\$708,016	\$13,908,513	
August, 1925	15,106,361	707,096	14,399,265	
September, 1925	14,800,668	708,034	14,092,634	
	\$44,523,558	\$2,123,146		
Total earnings after deducting all expenses incident to operations, also estimated taxes and interest on bonds of the subsidiary companies				\$12,400,412
Less, charges and allowances for depreciation, applied as follows, viz.: To depreciation and extraordinary replacement funds and sinking funds on bonds of subsidiary companies				\$11,233,089
To sinking funds on U. S. Steel Corporation bonds				2,685,439
				13,918,528
Net income				\$28,481,884
Deduct: Interest for the quarter on U. S. Steel Corporation bonds outstanding				\$4,407,654
Premium on bonds redeemed				269,407
				4,677,061
Balance				\$23,804,823
Dividends on stocks of the United States Steel Corporation, viz.: Regular—Preferred, 1 1/4 per cent.				\$6,304,919
Common, 1 1/4 per cent.				6,353,781
				\$12,658,700
Extra—Common, 1/2 per cent.				2,541,512
				15,200,212
Surplus for the quarter				\$8,604,611

The Inland Steel Co. and the Youngstown Sheet & Tube Co. were among those showing smaller earnings for the third than for the second quarter.

Inland Steel Co.

Third quarter earnings of the Inland Steel Co. amounted to \$1,189,235 compared with \$1,230,813 for the second quarter and \$931,384 for the corresponding period last year. Earnings for the quarter just closed

amount to 85 cents a share on the 1,182,799 shares of common stock of no par value. For the first nine months of the year, earnings were \$3,448,619 or \$2.47 a share against \$4,599,748 or \$3.44 during the same period one year ago. The income accounts for the third quarter of the two years compare as follows:

	1925	1924
Net after expenses	\$1,794,078	\$1,379,006
Depreciation and depletion	487,093	331,622
Interest and Federal taxes	117,750	116,000
Net income	1,189,235	931,384

	Nine Months
Net after expenses	\$5,406,572
Depreciation and depletion	1,510,453
Interest and Federal taxes	447,500
Net income	3,448,619

This company floated this week an issue of \$12,500,000 20-year 5 1/2 per cent debenture gold bonds, through Kuhn, Loeb & Co., New York. Proceeds of the issue will be used to reimburse the company for about \$5,000,000 heretofore expended for expansions and additions, and to provide additional funds to complete the company's present construction program, including the installation of blast furnace No. 4 at Indiana Harbor, Ind., the construction of 74 additional Koppers by-product coke ovens, and the complete electrification of the Indiana Harbor plant. "The company estimates the additional earnings from the new facilities thus provided and the savings created by electrification of the main plant at not less than \$1,500,000 per annum."

Youngstown Sheet & Tube Co.

THE earnings of this company have declined since the remarkable showing made for the first quarter of the current year. In that period net earnings were equal to \$3.48 per share of common stock, for the second quarter they were equivalent to \$3.22 per share and during the quarter just reported earnings were equal to \$3.08 per share of common stock. Third quarter earnings were \$3,299,436 as contrasted with \$3,424,835 for the preceding quarter. For the first nine months of the year net profits amounted to \$10,419,897 after all charges, against a little over \$6,000,000 for the same period last year. Heavy additions to the property and depreciation items account in part for the current statement. A comparison of the third quarter and nine-month periods for this year and last is given below.

	Third Quarter	
1925	1924	
Net after expenses	\$6,560,802	\$4,168,621
Other income	576,735	338,967
Total income	\$7,137,537	\$4,507,588
Dep., dep., and other chgs.	2,402,189	2,919,843
Int., etc.	1,070,912	1,088,846
Federal taxes	365,000	26,000
Net profits	\$3,299,436	\$472,899
Pfd. dividends	249,219	.....
Com. dividends	987,606	.....
Surplus	\$2,062,611	.....

	Nine Months Ended Sept. 30	
1925	1924	
Net after exp.	\$20,938,509	\$16,774,972
Other income	1,860,270	1,627,234
Total income	\$22,798,779	\$18,402,206
Dep., dep., and other chgs.	7,544,342	8,436,228
Int., etc.	3,555,540	3,311,572
Federal taxes	1,279,000	563,000
Net profits	\$10,419,897	\$6,091,406
Pfd. dividends	747,657	.....
Com. dividends	2,962,818	.....
Surplus	\$6,709,422	.....

Republic Iron & Steel Co.

One of the best third quarter reports was issued by the Republic Iron & Steel Co., which showed net earnings of \$1,166,591 as compared with \$235,150 for the corresponding period a year ago. Surplus for the quarter amounted to \$408,961, equivalent to \$1.36 a share on the outstanding common stock, as contrasted with a net loss, after deduction of dividends, etc., for the same quarter in 1924. For the nine months net income amounted to \$2,499,326 or \$3.95 a share on outstanding common, compared with \$1,765,004 or \$1.50 a share in the first three quarters of last year. The comparison of the third quarters follows:

	<i>Third Quarter, Ended Sept. 30</i>	
	1925	1924
Net oper. gains*	\$1,555,754	\$460,656
Deprecn.	302,363	191,904
Exhaust. mineral.	86,799	33,602
Net earns.	\$1,166,591	\$235,150
Int. on bonds.	320,130	280,529
Net income	\$846,461	+\$45,379
Pfd. divs.	437,500	437,500
Surplus	\$408,961	+\$482,879
	<i>For the Nine Months Ended Sept. 30</i>	
Net oper. gain*	\$4,628,856	\$3,566,291
Deprecn.	908,762	747,059
Depletion	244,927	195,053
Net earns.	\$3,475,166	\$2,624,179
Int. on bonds.	985,840	859,175
Net income	\$2,499,326	\$1,765,004
Pfd. divs.	1,312,500	1,562,500
Surplus	\$1,186,826	\$202,504

*After deducting charges for maintenance and repairs of plants.
†Deficit.

Unfilled orders on hand Sept. 30 amounted to 123,842 tons, as compared with 102,320 as of June 30, 1925, 140,055 tons as of March 31, and 77,998 tons as of Sept. 30, 1924.

Wheeling Steel Corporation

NET earnings for the third quarter of the Wheeling Steel Corporation were \$1,125,595 and for the nine months the corporation has earned \$2,720,473. Dividends are still deferred on the two classes of preferred stock as follows: Pfd.A. (1.4 per cent) 4.8 per cent or \$237,620, Pfd.B. (1.75 per cent) 6 per cent or \$1,353,582. This total of deferred dividends, \$1,591,202 stands against the company's present surplus as shown by the following comparative balance sheet:

	<i>Third Quarter</i>	<i>Nine Months</i>
Net income*	\$2,433,446	\$6,565,145
Less:		
Depreciation	864,880	2,516,090
Mine depletion	21,613	49,448
Interest	421,358	1,279,134
	\$1,307,851	\$3,844,671
Net profits applicable to dividends	\$1,125,595	\$2,720,473
Surplus July 1		6,239,873
Surplus Sept. 30		7,365,468
Dividends:		
Pfd.A. (1.4 per cent)	69,391	
Pfd.B. (1.75 per cent)	394,795	
	464,186	
Net surplus		\$6,901,282

*After deduction for repairs, maintenance and taxes.

Pittsburgh Steel Co.

THE Pittsburgh Steel Co. had a deficit of \$382,245 for the year ended June 30, after payment of dividends, according to the annual report just issued. With dividends on the common stock in the previous fiscal year exceeding those of the year just ended by \$104,994, the company had a surplus of \$18,686. The value of the company's shipments of materials for the year was \$23,217,962, as compared with \$23,926,890 in the previous year. Gross capital expenditures during the year were \$906,011, of which \$830,312 was on the steel plants and \$75,699 on the coal properties. Net capital expenditures were \$731,132, as \$106,458 spent for extraordinary replacements were charged to operations and the company sold machinery, coal land and real estate that credited \$68,421 to the plant account. The company had an average number of steel works employees of 3556 in the past fiscal year, against 4185

in 1924; of 603 coal property employees against 629 in the previous year and disbursed in wages and salaries \$8,603,159 in the past year, against \$9,951,105 the year before. Unfilled orders as of June 30, last, were 103,669 tons, against 66,788 tons on the same date in 1924.

Gulf States Steel Co.

This company reports a net operating income of \$333,621 for the third quarter ended Sept. 30, as against \$294,908 in the same period in 1924.

After providing for taxes, depreciation, etc., net profit was \$210,732, equivalent after preferred dividends to \$1.40 a share earned on 125,000 shares of common stock. This compares with net profit of \$171,445, or \$1.09 a share on common in preceding quarter, and net profit of \$176,487, or \$1.26 a share on 112,130 shares outstanding in third quarter of 1924.

Net profit for first nine months of 1925 amounted to \$778,524, equal after preferred dividends to \$5.38 a share on common, against \$719,276, or \$5.43 a share, in same period of the previous year.

The income account for the year in comparison with the previous year follows:

	1925	1924
Net earnings*	\$2,066,164	\$3,019,982
Int. and inc. from invest.	81,887	163,618
Bonds appreciation		47,734
Misc. revenue	75,448	292,513
Total earnings	\$2,223,499	\$3,523,847
Less reser., Int., tax, etc.	1,170,745	1,965,167
Net income for the year	1,052,755	1,558,680
Div. pfd. stock	735,000	735,000
Div. com. stock	700,000	804,994
	\$1,435,000	\$1,539,994
Deficit for the year	\$382,245	+\$18,686

*After deducting all charges for operations, including maintenance and repairs.

†Surplus.

Chicago Pneumatic Tool Co.

The Chicago Pneumatic Tool Co. and subsidiaries report for the third quarter an income of \$144,052, equivalent to \$1.39 a share on the outstanding common, as against \$132,695, or \$1.20 a share, in the corresponding quarter of 1924.

For the nine months ended Sept. 30 net income amounted to \$460,609, or \$4.45 a share, as compared with \$446,641, or \$4.05 a share, in the same period in 1924.

The consolidated income account for the quarter compares as follows:

	<i>Third Quarter</i>	
	1925	1924
Mfg. profit	\$145,571	\$157,300
Miscel. income	15,441	8,374
Total income	\$161,012	\$165,674
Interest	16,960	33,179
Net income	\$144,052	\$132,495
	<i>For the Nine Months Ended Sept. 30</i>	
Mfg. profit	\$466,582	\$494,994
Miscel. income	38,664	32,017
Total income	\$505,246	\$527,011
Interest	44,637	80,370
Net income	\$460,609	\$446,641

*After selling and administrative expenses, depreciation and taxes.

Changes in Philadelphia Jobbing Firm

Harrison I. Potts, senior partner in the Philadelphia steel jobbing firm of Horace T. Potts & Co., has retired after about 35 years of active participation in the business, but he retains his full partnership interest. His brother, Charles W. Potts, who has been in charge of the tool and alloy steel department, has become less active owing to ill health. The principal executive work of the firm is now being carried on by the other two brothers, Thomas C. Potts and Horace M. Potts. Another change in the personnel is the retirement of Edward Evans, manager of the culvert department, who had been connected with the business for about 30 years.

Better Feeling in European Markets

British Sheets and Tin Plate Active—German Trust Forming—French Export Business Good

(By Cablegram)

LONDON, ENGLAND, Oct. 26.

PIG IRON is steady, with domestic consumers showing moderate interest in foundry grades. Export demand is still poor. Hematite is firm, on good Continental buying and increasing home demand, while America is reported inquiring.

Foreign ore is quiet. Bilbao Rubio is held nominally at 20s. (\$4.84) c.i.f. Tees.

Finished steel demand is broadening and some sales have been effected, but competition among makers is keen and further concessions are obtainable.

Sheets and Tin Plate

Tin plate is firm, on good buying and the recent strong tin market. Some makers are asking up to 20s. 3d. (\$4.90) basis, I C, f.o.b., for forward business. For first quarter, 19s. 9d. to 20s. (\$4.78 to \$4.84) has been done. Export demand is broadening and makers are well placed.

Galvanized sheets are firm, with an upward tendency. Makers are quoting on January and February shipment as the earliest. Demand continues moderate.

Black sheets are moderately active in Japanese specifications, but other gages are quiet.

On the Continent of Europe

Continental markets are disorganized by further depreciation of the franc exchange rate, enhancing French competition, but the whole position is very much complicated. Sheet bars are being sold at £4 11s. and £4 14s. 6d. (\$22.02 to \$22.87), both f.o.b., for January and February shipments. Domestic users are well covered and not anxious buyers. Blooms are difficult to sell at £4 5s. (\$20.57) f.o.b. Wire rods are

firm at £5 15s. (\$27.83) f.o.b. Merchant bars are being sold at £5 5s. 9d. (1.14c. per lb.) f.o.b.

The Charleroi strike continues but fresh negotiations are under way and an early settlement is looked for.

In France, 141 blast furnaces were blowing on Sept. 1.

Proposed German steel trust negotiations are proceeding. An agreement in principle has been reached, involving Thyssen & Co., Phoenix A. G., Bochumer Verein, Rheinische Stahlwerke, Deutsch-Luxemburg Bergwerks & Hütten and the Gelsenkirchener Gussstahl & Eisenwerke [or Gelsenkirchener Bergwerks]. A preliminary investigating company, styled Vereinigte Stahlwerke A. G., has been formed, with a capital of 50,000m. (\$11,900).

Rombacher Hütte has blown out its remaining blast furnace at Konkordia, Bendorf. Thyssen & Co. are reducing their staff of workers by a further 7 per cent.

Sheets and Tin Plate the Only Active Spot in Britain—Shipbuilding Lowest Since 1909

LONDON, ENGLAND, Oct. 15.—Considerable interest has been displayed in the pig iron market during the last week or so by the substantial purchasing made on American account, the aggregate reaching a figure not before attained for some years. As the iron in question is of a special low-phosphorus grade, however, the general market has not yet been affected. Nevertheless, it will mean insured working of certain furnaces for the whole of next year.

Meanwhile the general conditions prevailing have

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.84 per £, as follows:

Durham coke, del'd...	f0 18s.	to f0 19s.	\$4.36	to	\$4.60
Bilbao Rubio ore†...	1 0 1/2		4.96		
Cleveland No. 1 fdy.	3 9 1/2		16.82		
Cleveland No. 3 fdy.	3 6 1/2		16.09		
Cleveland No. 4 tdy.	3 5 1/2		15.85		
Cleveland No. 4 forge	3 4 1/2		15.61		
Cleveland basic	3 5		15.73		
East Coast mixed...	3 14 1/2		18.03		
East Coast hematite	4 19		23.96		
Ferromanganese ...	15 10		75.02		
*Ferromanganese ...	15 5		73.81		
Rails, 60 lb. and up...	8 0	to 8 15	38.72	to	42.35
Billets	6 5	to 7 10	30.25	to	36.30
Sheet and tin plate bars, Welsh ...	6 5		30.25		
Tin plates, base box.	0 19 3/4	to 1 0 1/4	4.78	to	4.90
			C. per Lb.		
Ship plates.....	7 10	to 8 0	1.62	to	1.73
Boiler plates	11 10	to 12 0	2.48	to	2.59
Tees	7 15	to 8 5	1.67	to	1.78
Channels	7 0	to 7 10	1.51	to	1.62
Beams	6 15	to 7 5	1.46	to	1.57
Round bars, 1/2 to 3 in.	8 5	to 8 15	1.78	to	1.89
Steel hoops	10 15	and 12 10*	2.32	and	2.70*
Black sheets, 24 gage	11 5		2.43		
Black sheets, Japanese specifications	15 5		3.30		
Galv. sheets, 24 gage	16 10, upward		3.57, upward		
Cold rolled steel strip,					
20 gage	18 0		3.89		

*Export price.

†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports						
Foundry pig iron : (a)						
Belgium	f3	2s.	to f3	3s.	\$15.00	to \$15.24
France	3 2		to 3	3	15.00	to 15.24
Luxemburg	3 2		to 3	3	15.00	to 15.24
Basic pig iron : (a)						
Belgium	3 1		to 3	2	14.76	to 15.00
France	3 1		to 3	2	14.76	to 15.00
Luxemburg	3 1		to 3	2	14.76	to 15.00
Coke	0 18				4.36	
Billets :						
Belgium	4 9		to 4	11	21.54	to 22.02
France	4 9		to 4	11	21.54	to 22.02
Merchant bars :					C. per Lb.	
Belgium	5 5 1/2		to 5	6 1/2	1.14	to 1.15
Luxemburg	5 5 1/2		to 5	6 1/2	1.14	to 1.15
France	5 5 1/2		to 5	6 1/2	1.14	to 1.15
Joists (beams) :						
Belgium	5 2		to 5	3	1.10	to 1.11
Luxemburg	5 2		to 5	3	1.10	to 1.11
France	5 2		to 5	3	1.10	to 1.11
Angles :						
Belgium	5 4				1.12	
1/2-in. plates :						
Belgium	6 12 1/2				1.43	
Germany	6 12 1/2				1.43	
1/4-in. ship plates :						
Belgium	6 1		to 6	4	1.31	to 1.34
Luxemburg	6 1		to 6	4	1.31	to 1.34
Sheets, heavy :						
Belgium	6 14		to 6	15	1.45	to 1.46
Germany	6 14		to 6	15	1.45	to 1.46

(a) Nominal.

not shown much change. The policy of consumers at home is still one of restricted purchasing to cover their bare necessities only, while in the export markets foreign pig iron has still to be contended with. The buying of Continental semi-finished materials has been fairly good, owing to the increased activity in the sheet trades, but the business passing in heavy gages of iron and steel is poor.

Sheets Active

Activity has been displayed in galvanized sheets, all the main markets, including India, having bought pretty substantially, and there are now few works that have any space on their books for thick corrugateds for the rest of the year. The price has advanced, owing to good buying and to the strength of the spelter market, and £16 10s. (3.57c. per lb.), f.o.b., is the minimum quotation. Some works are unable to give earlier shipment than February.

Black sheets, as far as Japanese demand is concerned, have been quietly steady, and most mills will be occupied until the end of December. The tin plate trade also has been moderately brisk, with some consumers buying up to June. Here, also, prices have hardened, up to 20s. (\$4.84) basis, I. C., f.o.b. works' port, having been paid for option contracts by merchants. Apart from these three branches of the finished trade, however, there has been little buying of steel materials, either on home or foreign account.

According to Lloyds' shipbuilding returns for the July-September quarter, the ships under construction

in Great Britain and Ireland at Sept. 30 were of 1,009,155 tons, 84,000 tons less than on June 30 and 459,000 tons less than a year ago. Present totals, the lowest since December, 1909, are 881,000 tons below the average during the twelve months immediately preceding the war. An increase is shown in the tonnage commenced during the quarter, 260,551 tons, as compared with 189,805 tons during the second quarter of 1925, but that launched during the recent quarter, 225,236 tons, is 72,925 tons lower than for the previous three months.

Total world tonnage under construction, 2,206,905 tons, shows a decrease of 162,926 tons, compared with the previous quarter, and is 1,239,653 tons below the highest pre-war record, reached on June 30, 1913, at 3,446,558 tons. There are at present under construction in the world 21 vessels of between 10,000 tons and 20,000 tons each, and 10 of 20,000 tons and upward. Twelve out of the 21 and five of the larger vessels are buiding in Great Britain and Ireland.

At present 48 steamers and motor-ships, each of over 1000 tons, with a total tonnage of 344,136 tons, are under construction in the world for the carriage of oil in bulk. Of these tankers, 19 of 135,224 tons are under construction in Great Britain and Ireland, 10 of 89,600 tons in Germany and 11 of 65,900 tons in Holland. The tonnage of all vessels now building, which are to be fitted with internal combustion engines, amounts to 1,088,888 tons, while the tonnage of steam vessels under construction is 1,090,456 tons.

FRENCH EXPORTS GOOD

Inland Demand for Iron and Steel Not Satisfactory—Steel Entente Not Yet Formed

PARIS, FRANCE, Oct. 2.—The uncertainty which continues to prevail about the future of the industrial market, and particularly of the metallurgical market, precludes the hope that present activity in iron and steel will go beyond that replenishing of supplies which occurs every autumn. This year's receipts of French railroads have been continuously decreasing compared with last year's, and this decrease affects especially the three railroad systems serving our largest metallurgical concerns and the part of France most industrialized.

From the French metallurgists' point of view, the process of revalorization must be gradual and be accompanied by a parallel decrease of wages, taxes and other general expenses, or it will ruin that export trade which, in the present state of inland demand, is absolutely necessary to insure the proper running of our iron and steel industry. On the other hand, the French finance bill for 1926 contemplates increasing by new taxes the fiscal burden that already lies heavy on industry and trade.

No "Entente" Yet

Negotiations for renewing the "entente" for steel products continue. No solution has yet been reached, but the impression is more optimistic as the fear of reverting to ruinous competition has made the most uncompromising opponents of the O. S. P. M. to reconsider the case. These negotiations tend to allot each maker of steel products, in a pre-determined French consumption, a selling quota proportionate to his total capacity of production.

Coke.—During September, the O. R. C. A. has received from the Ruhr 221,072 tons of coke, a daily average of 7366 tons.

Pig Iron.—There is quiet demand for the present; but it will become more animated at the beginning of October. A selling group, undertaking to place on the market pig iron of lesser repute, rightly or wrongly, than certain other qualities, has established the following schedule of prices:

Pig iron classified according to surface and grain:		
No. 3 P. L.	345 fr. per metric ton or \$16.20 per gross ton	
No. 4 P. L.	344 fr.	16.25
No. 5 P. L.	343 fr.	16.20
No. 3 P. R.	340 fr.	16.06
No. 4 P. R.	336 fr.	15.87
No. 5 P. R.	332 fr.	15.68

Pig iron classified according to guaranteed analysis:		
4 to 5 per cent Si.	363 fr. or \$17.15	
3 to 4 per cent Si.	350 fr.	16.53
2.30 to 3 per cent Si.	343 fr.	16.20
1.70 to 2.30 per cent Si.	338 fr.	15.97
1.50 to 2 per cent.	333 fr.	15.73
1 to 1.70 per cent Si.	330 fr.	15.59

Export prices, quoted in Belgian francs, have slightly moved up, which, considering the fall of that currency, does not constitute a large advantage. Present prices, f.o.b. Antwerp, are: 340 Belgian francs (\$15.39 per gross ton) for foundry pig iron No. 3 P. L. and 320 to 325 fr. (\$14.47 to \$14.70) for basic pig iron. Hematite pig iron is firmly held both as to prices and selling conditions. British pig iron qualities are the object of but little attention for the present.

Semi-Finished and Rolled Products.—There is a little activity in semi-finished products, joists and rounds for concrete steel. Other products have a quieter market. Nevertheless, there is available tonnage in almost any description. Rails keep pretty busy. An order of 260 tons of Vignole rails (26 kg. standard or 52 lb. per yard) has been allotted to a Lorraine firm at 581 fr. (\$27.45) f.o.b. shipping port.

Business for export is rather satisfactory, even for producers of the West of France. A metallurgical company of Caen forwarded, from Sept. 18 to Sept. 19, 4200 tons of billets to South Wales. Prices quoted are:

Blooms	£4 7s.	or \$21.05
Billets	4 10 to 4 11s. 0d.	or 21.78 to \$22.02
Largets	4 13	22.50
Joists	£5 0s. to £5 1s. 6d. or 1.08c. to 1.10c. per lb.	
Bars	5 6	1.15c.
Merchant		
Iron	5 9 to 5 10 0	1.18c. to 1.19c.

Sheets.—Market unsteady. No improvement is likely to take place before something definite is known about either the renewing or the winding up of the "entente." There has been so much contradictory talk on the subject that consumers observe a guarded attitude. In heavy sheets, producers are still discounting orders to come from the French Navy, but so far these have not turned up. There is moderate activity also in fine sheets. In spite of the "entente," the prices offered by the different producers of the same region vary notably. For export, heavy sheets are quoted £6 2s. 6d. (1.32c. per lb.), Antwerp.

Foundry.—The activity is variable according to the works. Certain foundries are short of orders, while others are working at full capacity. Naturally, foundries supplying the stores with current catalog articles, and particularly those making heating apparatus, are very active.

MECHANICAL ENGINEERS

Features of the Annual Meeting in New York Beginning Nov. 30

The conferring of honorary membership on Hon. Herbert Hoover, Secretary of Commerce, and on Worcester R. Warner, past president of the American Society of Mechanical Engineers, and the establishment of two lectures, one named after Henry R. Towne and the other after Dr. Robert H. Thurston, are among the features of the coming annual meeting of the American Society of Mechanical Engineers to be held in New York at the Engineering Societies Building, Nov. 30 to Dec. 4. There will be the usual running of simultaneous sessions given over to the presentation of technical papers, but a departure will be made in the business meeting, scheduled for Wednesday afternoon, Dec. 2. At that time, each of the several professional divisions of the society will present a report of technical progress made in the preceding twelve months, and provisions will be made for inviting general discussions in each case.

Secretary of Commerce Hoover will deliver the Henry R. Towne lecture and will cover the "Relation between Engineering and Economics." Dr. Zay Jeffries, widely known for his researches both in ferrous and non-ferrous metals, will be the Robert H. Thurston lecturer, with the "Relation between Engineering and Science" as the subject. The lecture by Secretary Hoover is scheduled for the afternoon of Dec. 1 at 4.30 p.m., and that of Dr. Jeffries at the same hour on the afternoon of Dec. 3.

Among meetings to be held by various sections of the American Society of Mechanical Engineers are the following:

Bridgeport, Nov. 5—Subject: Aircraft. Speaker: Capt. Anton Heinen, German dirigible expert.

Buffalo, Nov. 6—Inspection trip through plant of the American Brass Co.

Hartford, Nov. 3—At Hartford Engineers' Club at 8 p.m. Subject: Production of Small Arms. Speaker: F. T. Moore, general works manager, Colts Patent Fire Arms Mfg. Co., Hartford.

New York, Nov. 12—At Engineering Societies Building, at 8:15 p.m. Subject: Subterranean Heat as a Source of Energy. Speakers: Prof. L. P. Breckenridge, George Otis Smith and J. D. Galloway.

New York Steel Treaters Hear Address on Ferroalloys

An informative address on the "Manufacture and Use of Ferroalloys" was delivered before the October meeting of the New York chapter of the American

COMING MEETINGS

November

American Institute of Steel Construction. Nov. 11 to 14. Annual convention, White Sulphur Springs, W. Va. Charles F. Abbott, 350 Madison Avenue, New York, executive director.

National Founders Association. Nov. 18 and 19. Twenty-ninth annual convention. Hotel Astor, New York. J. M. Taylor, 29 South LaSalle Street, Chicago, executive secretary.

American Society of Mechanical Engineers. Nov. 30 to Dec. 3. Annual meeting, Engineering Societies Building, 29 West Thirty-ninth Street, New York. Calvin W. Rice, 29 West Thirty-ninth Street, New York, secretary.

National Exposition of Power and Mechanical Engineering. Nov. 30 to Dec. 5. Grand Central Palace, New York. Charles F. Roth, International Exposition Co., Grand Central Palace, New York, manager.

Society for Steel Treating, Wednesday evening, Oct. 21, by J. H. Critchett, of the Electro Metallurgical Co., New York. This was the second of a series of meetings which the New York chapter is conducting at which practical talks on various phases of the manufacture and use of steel are to be given each month this year by leaders of the industry.

Quad-City Foundrymen's Association

The Quad-City Foundrymen's Association held its second meeting of the fall at the LeClaire Hotel, Moline, Ill., Monday evening, Oct. 19. Eighty members were present and the meeting was devoted to discussion of various papers read at the convention of the American Foundrymen's Association at Syracuse, N. Y., Oct. 5 to 9. Hyman Bornstein, Deere & Co.; W. M. Thomas, Union Malleable Iron Co.; Fred Kirby, Marseilles Works; Max Sklovsky, Deere & Co., and J. H. Diedrich, Black Hawk Foundry Co., touched upon different subjects which were treated in the papers and discussions at the convention. A. E. Hageboeck, Frank Foundries Corporation, reviewed some of the work done by various members of the national association in the field of cost accounting and as a director of that body presented D. S. McDowell, Deere & Co., with a check for being one of three who came within one-half a pound of guessing the correct weight of a casting on exhibit at the convention.

Emergency Coke Rates from Birmingham to Michigan

WASHINGTON, Oct. 27.—The Interstate Commerce Commission has granted permission to the Alabama Great Southern and the Louisville & Nashville railroads to establish rates on coke and breeze from the Birmingham district to southeastern Michigan which are 50c. and 75c. higher than the rates from the Chattanooga, Tenn., district. The application of the railroads to establish the rates was based on what they termed the emergency condition resulting from the anthracite strike. The joint rates authorized can, under the action of the commission, be put into effect on 10 days' notice. The destinations are east of the Grand Rapids & Indiana line on the Pennsylvania and south of the Pere Marquette Railroad. The carriers said their application had the approval of the Central Freight Association coal and coke committee. Protest was made against establishing the rates by the By-Products Coke Corporation, Chicago, in behalf of the Citizens Gas Co. of Indianapolis; the Chicago By-Product Coke Co.; the Indiana Coke & Gas Co., Terre Haute, Ind.; the Laclede Gas Co., St. Louis; the Milwaukee Coke & Gas Co.; St. Louis Coke & Iron Co., Granite City, Ill., and Pickands, Brown & Co., Chicago.

Puddling and Bar Iron Wage Rates

YOUNGSTOWN, Oct. 27.—Tonnage rates paid puddlers and bar iron finishers in midwestern mills operating under the sliding scale wage agreement of the Amalgamated Association of Iron, Steel and Tin Workers continue unchanged for November-December, following the bimonthly settlement today. The average selling price of bar iron shipped in the 60 days ended Oct. 20 was disclosed at 1.95c. per lb., unchanged from the average two months ago.

The puddling rate continues at \$11.13 per ton, while rates paid finishers remain at 44½ per cent above base. Owing to higher prices developing for bar iron, an increase in the rates is predicted for the January-February, 1926, period.

The Southern Ferro-Alloys Co., Chattanooga and Cleveland, Tenn., states that the negotiations mentioned on page 1056 of our Oct. 15 issue, in connection with possible merger with the Bon Air Coal & Iron Corporation, Nashville, have come to naught. Paul J. Kruesi, president, states that none of the stock nor plants of the Ferro-Alloys company has changed ownership.

FABRICATED STEEL

Awards Total 61,000 Tons—Two Large Structural Jobs in New York Placed

Total structural steel awards of 61,000 tons in the week are headed by two large New York jobs, one of 20,000 tons for an office building and 11,200 tons of subway work. A club building in Chicago and a blast furnace to be erected near St. Louis each take 3500 tons. The largest projects pending are a viaduct in Jersey City, 4500 tons, and a machinery building for the Sesqui-Centennial Exposition, Philadelphia, also 4500 tons. Awards follow:

Eastern Offices, Inc., office building north of Grand Central Terminal, New York, 20,000 tons, to McClintic-Marshall Co.

Washington Heights subway, New York City, sections Nos. 4 and 6, totaling 11,200 tons, to American Bridge Co.

Central Railroad of New Jersey, bridges, 1600 tons, to American Bridge Co.

Loft and office building, Sixth Avenue and Thirty-first Street, New York, 2500 tons, to Harris Structural Steel Co.

D. Auerbach & Sons, candy factory addition, Eleventh Avenue, New York, 100 tons, to Hay Foundry & Iron Works.

Chesapeake & Ohio Railroad, bridges, 250 tons, to an unnamed fabricator.

Dwight P. Robinson & Co., apartment building at Fifth Avenue and Eightieth Street, New York, 500 tons, to New York Shipbuilding Corporation (now the American Brown-Boveri Co.).

Dwight P. Robinson & Co., apartment building, Sixth Avenue and Fifty-fourth Street, New York, 2200 tons, to Bethlehem Fabricators, Inc.

Connecticut Co., car barns at Waterbury, Conn., 300 tons, to American Bridge Co.

Apartment building, West End Avenue and Ninety-third Street New York, 1300 tons, to A. E. Norton, Inc.

Apartment building at 107 West Ninety-third Street, New York, 800 tons, to A. E. Norton, Inc.

Morgan Construction Co., Worcester, Mass., 200 tons, to McClintic-Marshall Co.

Candy plant, Cambridge, 150 tons, to Palmer Steel Co.

High school, Cranston, R. I., 125 tons, to Providence Steel & Iron Co.

American Laundry Machinery Co., Cincinnati, 200 tons, to Moss Iron Works.

Chevrolet Motor Co., Norwood, Ohio, loading platform, 125 tons, to L. Schreiber & Sons Co.

Union Drawn Steel Co., Beaver Falls, Pa., factory at Massillon, Ohio, 230 tons, to Fort Pitt Bridge Works.

Grandstand, Williamsport, Pa., 130 tons, to an unnamed fabricator.

Lake Shore Athletic Club, Chicago, 3500 tons, to McClintic-Marshall Co.

Illinois Central, Grant Park, Chicago, six bridges, 1600 tons, to American Bridge Co.

Garage operating tables, Jewelers Building, Chicago, 475 tons, to an unnamed fabricator.

Bridges, North Side sewage disposal plant, Niles Center, Ill., 100 tons, to Continental Bridge Co.

Saginaw Products Co., building, Saginaw, Mich., 300 tons, to Austin Co.

Illinois Central passenger station, Jackson, Miss., 1500 tons, to Virginia Bridge & Iron Co.

Dodge Mfg. Co., Mishawaka, Ind., factory, 500 tons, to McClintic-Marshall Co.

Illinois Central, viaduct, Memphis, Tenn., 1500 tons, to Virginia Bridge & Iron Co.

Commonwealth Edison Co., Chicago, addition to Fisk Street power station, 500 tons, to American Bridge Co.

Indian Refining Co., Memphis, Tenn., building, 600 tons, to American Car & Foundry Co.

Viaduct, Milwaukee, Wis., 600 tons, to Wisconsin Bridge Co.

Aronson Building, Fourth Street, San Francisco, 1100 tons, to Pacific Rolling Mill Co., Inc.

Apartment building, Buchanan and Green Streets, San Francisco, 196 tons, to Schrader Iron Works.

Washougal Bridge, Wash., 135 tons, to Pacific Iron Works.

Metropolitan Building, Bellingham, Wash., 300 tons, to Wallace Equipment Co.

Everett Pulp & Paper Co., Everett, Wash., 319 tons, to Wallace Equipment Co., and 135 tons to Minneapolis Steel & Machinery Co.

St. Louis Coke & Iron Co., blast furnace, 3500 tons, to Riter-Conley Co.

Willys-Overland Co., Toledo, 150 tons, to American Bridge Co.

New York-New Jersey vehicular tunnel work, 2100 tons, to Phoenix Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

State of New Jersey, viaduct over Erie Railroad tracks connecting with New York-New Jersey vehicular tunnel, 4500 tons.

Sesqui-Centennial Exposition, Philadelphia, machinery building, 4500 tons.

Johns Hopkins University, Baltimore, dispensary building, 2000 tons.

Reading Co., bridges, 300 tons.

New York Central Railroad, bridges, 400 tons.

Pennsylvania Railroad, bridges, 300 tons.

Julius Tishman & Sons, apartment building, Park Avenue and Ninetieth Street, New York, 1500 tons.

Store and loft building, 316 Seventh Avenue, New York, 600 tons.

Telephone Exchange, Brighton, Boston, 125 tons.

Procter & Gamble Co., building on Staten Island, N. Y., 400 tons; general contract awarded to H. K. Ferguson Co., Union Drawn Steel Co., Beaver Falls, Pa., warehouse at Hartford, Conn., 150 tons.

Worthington Pump & Machinery Corporation, Cincinnati, building, 100 tons.

Charleston, W. Va., highway bridge, 400 tons.

Huntington, W. Va., highway bridge, 200 tons.

Continental Oil Co., building, Denver, Colo., 1000 tons.

Office building, Oklahoma City, Okla., 1000 tons.

Building, Burkbett, Tex., 700 tons.

Quigley Building, Salt Lake City, Utah, 700 tons.

Wabash Monroe Building, Chicago, 1800 tons.

Elitel Hotel, Cass Street, Chicago, 1300 tons.

Theater, Filmore and California Streets, San Francisco, 200 tons.

Unnamed oil company, 425 tons of plates.

St. Luke's Hospital, Cleveland, 1000 tons.

Cleveland sewage disposal plant, 150 tons.

New Colton Manor, Atlantic City, N. J., 1000 tons.

RAILROAD EQUIPMENT

Car Orders Total 1200 and One New Inquiry Is for 1000 Steel Gondolas

The order of the Central of Georgia for 1000 box cars and the inquiry of the New York Central for 1000 steel gondolas are the principal railroad equipment items of the week. The week's news of the railroad equipment field follows:

It is reported that the Delaware, Lackawanna & Western Railroad will soon issue an inquiry for 2000 cars and that the Lehigh Valley will come into the market for 1200.

The Central of Georgia (Illinois Central Lines) has ordered 1000 box cars from the Tennessee Coal, Iron & Railroad Co.

The Illinois Central has bought 200 stock cars from the General American Tank Car Corporation.

The New York Central has issued an inquiry for 1000 50-ton, all steel gondolas.

The New York, New Haven & Hartford has inquired for 4 dining cars.

Bids have gone in on 6544 4-wheel railroad cars for the Indian State Railways, India.

The Amtorg Trading Co., New York, has ordered 25 electric mine locomotives for shipment to Russia from the Westinghouse Electric & Mfg. Co.

The James Hatcher Coal Co. has ordered 50 mine cars and the Chicago, Wilmington & Franklin Coal Co. has ordered 25 mine cars from the American Car & Foundry Co.

The Central of Georgia has placed four locomotives with the Lima Locomotive Works, Inc.

The Chicago, Indianapolis & Louisville has ordered 500 underframes from the Pullman Car & Mfg. Co.

The Missouri Pacific has ordered 5 diners from the Pullman Car & Mfg. Co. The Missouri Pacific is inquiring for 250 stock cars in addition to recent inquiries.

The St. Louis Southwestern is in the market for 500 box car underframes.

Iron and Steel Markets

A BROADENING MARKET

Unfilled Orders Increase in October and Prices Stiffen

Coke Advance Creates a Highly Specula- tive Situation as Pig Iron Moves Up

Betterment in the steel market is more pronounced this week and is shown in a further increase in new business and in the firmer stand on prices taken by leading producers. Railroad demand, apart from heavy rail bookings, is growing; pig iron prices have advanced again, as the coke situation has tightened, and the expectation of a large-scale operation of mills through the winter is now more pronounced.

October gains in unfilled orders have been general in the heavy products. With the large rail contracts closed in the past week, that total has gone beyond 1,000,000 tons, and the inquiry still pending may increase it by 200,000 to 300,000 tons in the near future.

Not only is the situation in merchant pig iron and in coke more highly speculative than a week ago, due to the anthracite strike, but there is the remarkable feature that coke has been sold by several leading steel companies, in view of its high price and great demand for domestic use. As high as \$10 has been paid for crushed coke, and blast furnace coke has gone to \$8.50 and \$9 at ovens.

A further uncertainty of the pig iron market is the fact that blast furnaces having their coke bought to the end of the year can make a larger profit by reselling it than by using it in the production of pig iron.

Increased pig iron sales and inquiry have been a feature of the week. In all districts sales for the first quarter of 1926 have been at higher prices, and a further early advance of 50c to \$1 is indicated.

Greater than expected, the Steel Corporation's earnings for the third quarter at \$42,400,000 were \$1,776,000 more than for the April-June period. Railroad earnings of the corporation, especially in the case of ore roads, ran well above those for the second quarter.

Farm implement works are running fuller than at any time in three years and leaders in that industry look for a large demand in 1926. Current steel orders from motor car companies are well beyond the promise of August and September.

Steel works operations ranging from 80 to 83 per cent are reported from the leading districts, and at the same time delivery periods, particularly in bars, are gradually lengthening.

In the Chicago district new sales of finished steel in October, rails being an important factor, have been thus far nearly 25 per cent above those of September, with specifications running 30 per cent beyond those for last month.

The price advances in sheets, running from \$1 a ton on black to \$3 a ton on automobile body stock, are more definitely established this week.

Hot-rolled flats, hoops, bands and strips are stronger and leading makers of cold-rolled strips announce a \$3 advance from the recent low level. Rivets and cap and set screws are likewise higher. Steel scrap, on good buying at Pittsburgh, is up 50c. a ton.

An order for 1000 box cars from the Central of Georgia and an inquiry for 1000 steel gondolas from the New York Central are new items in railroad equipment, and there is a growing volume of smaller orders.

In rails, the New York Central distribution of 206,745 tons is the leading announcement, 155,000 tons of the total being specified for early delivery. Without formal inquiry, upward of 150,000 tons is looked for as a Pennsylvania reservation, also 85,000 tons for the B. & O. and probably 100,000 tons for the Santa Fe. The Missouri Pacific has bought 40,000 tons and the Southern Railway, 46,200 tons.

Structural steel awards of the week are swelled to 61,000 tons by the letting of 20,000 tons of steel for a large office building in New York and 11,200 tons for New York subway work. A blast furnace to be erected near St. Louis and a club building in Chicago will each take 3500 tons. Of 25,000 tons of new work in the market, a viaduct for Jersey City and an exposition building in Philadelphia call for 4500 tons each.

THE IRON AGE composite prices show an advance in both pig iron and finished steel. Pig iron has gone up 50c. to \$20.38, being now \$1.42 above its low point in July and more than \$1 above the low level of last November. Finished steel is up to 2.410c. per lb., from 2.403c. the last four weeks and 2.396c. for the six weeks before that period.

Pittsburgh

Increased Bookings Give Strength to Prices—Scrap Up to September Levels

PITTSBURGH, Oct. 27.—Continued good business, together with the fact that they have given their customers ample opportunity to cover against their probable requirements for the remainder of the year, has put manufacturers of several lines of finished steel in a position with regard to order books which, they feel, warrants a stronger attitude on prices. The advance made about two weeks ago in sheets has in the past week found as nearly complete support as price changes ever do. There is no longer any question as to the prices of hot-rolled flats, hoops, bands and strips, and late last week leading makers of cold-rolled strips announced an advance of \$3 per ton. Rivets, after selling for months at prices which makers contend put them in red ink, have been marked up to levels that will show a profit, and a similar reason is behind higher prices on cap and set screws. The tonnage offered in the major products has not yet brought about higher prices.

The agricultural implement industry is running at a higher rate now than at any time in the past three

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 27, 1925	Oct. 20, 1925	Sept. 29, 1925	Oct. 28, 1924
No. 2X, Philadelphia	\$23.26	\$22.76	\$22.26	\$21.76
No. 2, Valley furnace	19.50	19.00	19.00	19.50
No. 2, Southern, Cin'ti	24.05	23.55	23.05	21.55
No. 2, Birmingham, Ala.	20.00	19.50	18.50	17.50
No. 2 foundry, Ch'go furn.	22.00	21.50	21.50	20.50
Basic, del'd, eastern Pa.	22.00	21.00	21.00	20.00
Basic, Valley furnace	19.00	18.50	18.50	19.00
Valley Bessemer del'd P'gh	21.76	21.26	21.26	21.76
Malleable, Chicago furn.	22.00	21.50	21.50	20.50
Malleable, Valley	19.50	19.00	19.00	19.50
Gray forge, Pittsburgh	20.76	20.26	20.26	20.76
L. S. charcoal, Chicago	29.04	29.04	29.04	29.04
Ferromanganese, furnace	115.00	115.00	115.00	95.00

Rails, Billets, etc., Per Gross Ton:

O.-h. rails, heavy, at mill	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh	33.50	33.50	35.00	35.50
O.-h. billets, Pittsburgh	33.50	33.50	35.00	35.50
O.-h. sheet bars, P'gh	33.50	33.50	35.00	37.00
Forging billets, base, P'gh	40.00	40.00	40.00	40.50
O.-h. billets, Phila.	39.30	39.30	40.30	41.17
Wire rods, Pittsburgh	45.00	45.00	45.00	45.00
Cents Cents Cents Cents				
Skelp, gr. steel, P'gh, lb.	1.90	1.90	1.90	1.90
Light rails at mill	1.65	1.65	1.65	1.80

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.12	2.32
Iron bars, Chicago	1.90	1.90	1.90	2.10
Steel bars, Pittsburgh	2.00	2.00	2.00	2.00
Steel bars, Chicago	2.10	2.10	2.10	2.00
Steel bars, New York	2.34	2.34	2.34	2.34
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Chicago	2.10	2.10	2.10	2.00
Tank plates, New York	1.94	1.94	2.04	1.94
Beams, Pittsburgh	1.90	1.90	1.90	1.90
Beams, Chicago	2.10	2.10	2.10	2.00
Beams, New York	2.24	2.24	2.24	2.14
Steel hoops, Pittsburgh	2.50	2.40	2.40	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	Oct. 27, 1925	Oct. 20, 1925	Sept. 29, 1925	Oct. 28, 1924
<i>Per Lb. to Large Buyers:</i>				
Sheets, black, No. 28, P'gh	3.15	3.10	3.10	3.50
Sheets, black, No. 28, Chicago dist. mill	3.25	3.25	3.30	3.60
Sheets, galv., No. 28, P'gh	4.30	4.20	4.20	4.60
Sheets, galv., No. 28, Chicago dist. mill	4.40	4.35	4.35	4.70
Sheets, blue, 9 & 10, P'gh	2.30	2.25	2.25	2.70
Sheets, blue, 9 & 10, Chicago dist. mill	2.40	2.40	2.40	2.80
Wire nails, Pittsburgh	2.65	2.65	2.65	2.75
Wire nails, Chicago dist. mill	2.70	2.70	2.70	2.85
Plain wire, Pittsburgh	2.50	2.50	2.50	2.50
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.60
Barbed wire, galv., P'gh	3.35	3.35	3.35	3.45
Barbed wire, galv., Chicago dist. mill	3.40	3.40	3.40	3.55
Tin plate, 100 lb. box, P'gh	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:

Carwheels, Chicago	\$18.00	\$17.50	\$17.50	\$17.50
Carwheels, Philadelphia	18.50	18.50	18.50	17.50
Heavy steel scrap, P'gh	19.00	18.50	18.00	19.00
Heavy steel scrap, Phila.	17.00	17.00	17.00	16.50
Heavy steel scrap, Ch'go	16.00	16.00	16.00	16.50
No. 1 cast, Pittsburgh	18.00	17.50	17.00	18.00
No. 1 cast, Philadelphia	18.00	18.00	18.00	17.50
No. 1 cast, Ch'go (net ton)	18.00	17.75	17.75	17.50
No. 1 RR. wrot, Phila.	18.50	18.00	18.00	17.50
No. 1 RR. wrot, Ch'go (net)	15.00	14.50	14.50	14.50

Coke, Connellsburg,

Per Net Ton at Oven:				
Furnace coke, prompt	\$8.50	\$7.50	\$8.50	\$3.00
Foundry coke, prompt	\$8.50	7.50	4.25	4.00

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	14.75	14.62 1/2	14.62 1/2	13.50
Electrolytic copper, refinery	14.50	14.37 1/2	14.12 1/2	13.25
Zinc, St. Louis	8.60	8.30	7.82 1/2	6.52 1/2
Zinc, New York	8.95	8.65	8.17 1/2	6.87 1/2
Lead, St. Louis	9.25	9.25	9.25	8.75
Lead, New York	9.60	9.60	9.55	9.00
Tin (Straits), New York	63.25	62.50	59.12 1/2	52.00
Antimony (Asiatic), N. Y.	19.00	18.00	17.25	11.75

THE IRON AGE Composite Prices

Oct. 27, 1925, Finished Steel, 2.410c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.	One week ago	2.403c.
	One month ago	2.403c.
	One year ago	2.460c.
	10-year pre-war average	1.689c.

Oct. 27, 1925, Pig Iron, \$20.38 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.	One week ago	\$19.88
	One month ago	19.63
	One year ago	19.46
	10-year pre-war average	15.72

years. The automobile industry is experiencing a business of proportions much in excess of the expectations of a few months ago. Railroad buying of rails, track supplies and of rolling stock is giving the industry an outlet for steel to offset the losses sustained in the seasonal lines like pipe and tin plate. There is a well-supported theory that when the railroads are buyers there is not much hesitancy in other steel-consuming industries about purchases. It really looks as though the steel market was working to a stronger price basis and to help along the movement the past week has seen scrap go back on some good sized sales to its early September levels, which were the highest since early in the year. Then there is the factor of a strong

pig iron market. This has been helped to higher levels by the recent big sales and the appearance of some good sized inquiries. While these are inspired partly by the coke situation, which portends higher pig iron prices for the early part of next year, they also have been due in part to better business and the improved business outlook.

The week has been marked by a less excited coke market, but has brought no definite signs of a break in the anthracite deadlock, and accordingly the strength of the coke situation is assuming an appearance of permanence. The Carnegie Steel Co. has put on a blast furnace at Clairton, giving it 34 active stacks out of a total of 56. The National Tube Co. has taken off one of

High	Low	High	Low
1923 April 24 2.789c.	1924 Jan. 15 2.560c.	1925 Jan. 6 Finished Steel	1925 Aug. 18 2.496c.
\$20.86, March 20	\$22.88, Feb. 26	\$22.50, Jan. 13	\$18.96, July 7

1924	1925	1924	1925
2.560c., Jan. 15	2.496c., Aug. 18	2.460c., Oct. 14	2.446c., Jan. 20

1925	1924	1925	1924
\$18.96, July 7	\$19.31, Nov. 3	\$20.77, Nov. 20	\$20.77, Nov. 20

its McKeesport furnaces and the Bethlehem Steel Co. has one less stack in production at Johnstown, Pa. These changes constitute the only important ones in steel plant operations.

Ingot production is 80 per cent of capacity, or possibly a little more. The Wheeling district is showing up particularly well, with virtually full physical capacity production. There is caution about adding to active capacity, probably because frequent experiences in the past few years have taught that there is danger of producing ahead of the demand. Excess production has been a prolific cause of price weakness.

Pig Iron.—Prices of all grades of iron are up 50c. a ton on actual business and it is probable that before this week is out a further advance of 50c. a ton will have been recorded, as producers generally are asking an advance of \$1 over their recent minimum prices and there is enough interest in supplies on the part of consumers and indifference on the part of producers about selling to make almost certain a \$20 market on foundry iron in the next few days. Inquiry has expanded materially and rapidly in the past week. There is not only a better business and a favorable outlook, but also the fact that another week has gone by with no definite sign of a termination of the hard coal strike. The thought that there might be an early settlement of the anthracite trouble and, with it a break in the coke market, no longer finds many subscribers and the belief is now general that regardless of the hard coal situation, coke is going to be considerably higher for the early part of 1926 than it is on contract supplies for this quarter. Merchant producers are now asking \$20, Valley furnace, for No. 2 foundry, \$19.50 for basic, \$20.50 for Bessemer and corresponding advances in gray forge and malleable grades. We note one sale of 150 tons of Bessemer at \$20.50, but the week's business includes one lot of 1000 tons at \$20 and one or two smaller lots at the same figure. Based on sales, the market on this grade is therefore quotable from \$20 to \$20.50. The same situation exists in basic and foundry grades. While producers now want \$19.50 for basic, the week's business includes one lot of 2000 tons for delivery to an Ohio River steel maker at \$19, and there also was a sale of approximately 2000 tons of basic iron to a Pittsburgh melter at the same figure. Small sales of No. 2 foundry have been made at \$20, but a larger tonnage has been moved at \$19.50. A quotation of \$19.50 per ton on 2000 tons of No. 3 foundry proved uninteresting to the buyer. New inquiries include 5000 tons of basic iron from the Sharon Steel Hoop Co. for November and December delivery, 5000 tons of basic for first quarter delivery to the Sharon, Pa., plant of the National Malleable & Steel Casting Co., 700 tons of No. 1 and No. 2 foundry for shipment this year to the Cleveland works of the Westinghouse Electric & Mfg. Co., 2000 tons of No. 2 foundry for first quarter shipment to the Union Radiator Co., Johnstown, Pa., 6000 tons of foundry iron and 3000 tons of low phosphorus iron for shipment over the first six months of next year to the Mackintosh-Hemp hill Co., Pittsburgh, and 21,000 tons of foundry and malleable iron for first quarter shipment to the Buick Motor Car Co., at Detroit, Flint, and Saginaw, Mich.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$19.00 to \$19.50
Bessemer	20.00 to 20.50
Gray forge	19.00 to 19.50
No. 2 foundry	19.50 to 20.00
No. 3 foundry	19.00 to 19.50
Malleable	19.50 to 20.00
Low phosphorus, copper free	27.00 to 27.50

Ferroalloys.—Spiegeleisen has advanced \$1 a ton since a week ago, this change reflecting not only a brisk demand that has provided makers with reasonably full order books but also the prospect of higher coke prices for the first quarter of 1926. Several thousand tons for delivery over the remainder of this year and the first half of next year have been placed. For single carloads makers now are asking \$34 per ton, furnace, for average 20 per cent material, with the usual differentials for larger lots. There is not much activity in ferromanganese, users of which show no inclination to abandon a hand-to-mouth buying policy. Prices are

unchanged. New sales of 50 per cent ferrosilicon are few and small. Prices are given on page 1221.

Semi-Finished Steel.—There is still a price of \$35, Pittsburgh, on billets and slabs, but it is for steel for strips or tube rounds, specifications of which are exacting. Billets or slabs for other purposes are available at \$33.50, which is also the price on sheet bars. It is now said that only a small part of the year's tonnage of sheet bars has carried a higher price than \$33.50, Pittsburgh or Youngstown, as that was the price to contract customers and there was very little buying beyond contract shipments. Spot demands are very few and new business in billets and slabs, as distinct from specifications on contracts, is light. Makers of forging quality billets still maintain they have made sales at \$40, base. The usual differential between ordinary and forging quality billets is \$5 a ton, but the few mills that now want business in the latter grade seem indisposed to take orders at that price spread, contending that the cost is more than \$5 a ton higher in forging than in ordinary steel. Wire rods are slow, but there are no reports of sales at less than \$45 base, Pittsburgh or Cleveland, although it is not contended that the net Pittsburgh mill price is \$45 in all cases. Skelp business still lags. Prices are given on page 1221.

Wire Products.—Business makes a fairly good showing in comparison with other recent years at this season, but all makers admit that there is room for improvement, not only in the total but in the distribution of the tonnage. A really good business is being done in plain wire and nails are moving well, but there is not nearly as much demand for barbed wire and fence as was expected. There is a belief in some quarters that use of fence is not so great as it was a few years ago, or since the farm boundary law was clarified to the extent that the building of a fence was an obligation of the farmer with live stock rather than of the farmer who had an orchard or corn field to safeguard against his neighbor's stock. Prices are very steady on wire products in this market except on coated nails, in which there is considerable price competition. On an order from Florida for five cars, calling for needle point nails, it is said a flat price of \$1.80 was named. Prices are given on page 1220.

Rails and Track Supplies.—Standard rail business for 1926 delivery continues to come in. Closely on the heels of the Baltimore & Ohio purchase of 85,000 tons, is the New York Central order for 208,000 tons, and it is said that the Pennsylvania Railroad's requirements have been computed and a formal inquiry soon will go out. Total bookings now aggregate almost 900,000 tons. No considerable activity is yet observed locally in track supplies, but the Baltimore & Ohio has asked for prices on 3,000,000 tie plates. Light rails are not moving in volume. Prices are given on page 1220.

Tubular Goods.—Standard pipe is still in good demand and there is a fair sprinkling of small orders for line pipe, but business in oil well pipe is still decreasing. Outside of line pipe, notably for gas lines in the Southwest, the mills have not found it easy at any time this year to accumulate backlog tonnages and changes in the demand up or down have quickly affected plant operations. In maintaining the recent rate of production, there has been some building up of mill stocks. The National Tube Co. has taken off a blast furnace at its McKeesport, Pa., plant, but that leaves it with nine of its 11 stacks in production, with the two at Wheeling still producing, although no pipe is being made there. There is nothing new as to prices. Mechanical tubing is still in strong demand, primarily because of the activity of the automobile industry. Boiler tubes remain weak. Discounts are given on page 1220.

Sheets.—Mills that as recently as a week ago were taking business at less than 3.15c., base, Pittsburgh, for black, 2.30c., base, for blue annealed, and 4.30c., base, for galvanized, appear to have secured the backlog they were after and those prices now seem well established as the minimum bases on the general run of new business. It is doubtful if any considerable part of current shipments carry those prices, because there were few consumers that did not have a chance

to cover for good-sized tonnages at the old prices. The fact that makers are well provided with business, however, is a factor of strength, and in the case of galvanized sheets, price shading is discouraged by the high cost of zinc, which lately has gone above 9c. per lb. Specifications and shipping instructions are being given freely on the common finishes, while there is a genuinely good demand for automobile body sheets, users of which are getting fretful under the more deferred deliveries that mills now can make, and are disposed to build reserves. The new price of 4.40c., base, has been established by several sales for December delivery, one of which amounted to 6000 tons. The American Sheet & Tin Plate Co. reports orders and specifications so far this month to be equal to those for the whole month of January, which as a business month was the best the company had this year. Sheet mill operations still average 80 per cent. Prices are given on page 1220.

Tin Plate.—No announcement yet has been made as to first quarter and first half of 1926 prices, but the more common opinion is that the present price will be reaffirmed. Pig tin has been above 64c. per lb., but in the past few days has eased off slightly. It is intimated that present prices are the result of speculative manipulation rather than of a real shortage, and that a drop is more probable than an advance from present levels. The leading maker of tin plate is well provided with business and last week operated more than 86 per cent of its capacity. Independent companies still have fairly high operations, but are pretty well through their live orders.

Cold-Finished Steel Bars and Shafting.—Consumers are still able to get such prompt deliveries against orders that they are not disposed to buy very far ahead. But actual requirements constitute a good tonnage and dissatisfaction is chiefly about prices.

Steel and Iron Bars.—Mills in this district are still well supplied with steel bar business and on screw stock bars for cold finishing are so heavily committed that delivery promises range from four to eight weeks, the longer delivery being on the spark plug and other sizes finding heavy use by the automobile builders. On ordinary merchant bars and reinforcing bars, reasonably prompt delivery still is being made. A good deal of the tonnage moving from mills in this district carries a price of 1.90c., base, Pittsburgh, but on new business there are no deviations from 2c. on ordinary tonnages. There is gradual improvement in demand for iron bars with prices steady. Prices are given on page 1220.

Structural Material.—There is no change in the price range for this product, but it takes a more attractive order to bring out the lower quotation than was the case recently. On small tonnages for quick delivery, the ruling price is 2c., base, Pittsburgh, for large structural shapes. Structural shops in this district want tonnage to keep their equipment engaged during the late winter months, but only a few of them can take early delivery business. Plain material prices are given on page 1220.

Plates.—Local mills are inclined to take a firmer stand on prices, but this seems to be based on the idea that with the railroads interested considerable business is close at hand. Actual bookings have not yet reached sufficient proportions to enable producers to sustain an advance. Prices are given on page 1220.

Hot Rolled Flats.—All makers are well supplied with orders and mill operations are gaining, as buyers are specifying very freely. Not much business has yet been done at 2.50c., base, for narrow stock and 2.30c., base, for wide material, but those prices are closely observed on new business.

Cold Rolled Strips.—Leading makers have announced an advance of \$3 a ton to 3.90c., base, Pittsburgh. This was forecast by the recent advance in hot rolled strips, and buyers were able to purchase heavy tonnages before it occurred.

Bolts, Nuts and Rivets.—Effective today, leading makers of rivets have advanced prices of large rivets to \$2.60, base, per 100 lb., f.o.b. Pittsburgh, \$2.70, base

Cleveland, and \$2.75, base Chicago. Pittsburgh district makers have had a quotation of \$2.50, but \$2.40 seems to have been as much as was obtained on sales and even \$2.35 was fairly frequent on large orders running to sizes carrying good-sized extras. Heretofore there has been a common base price for Pittsburgh and Cleveland, but in the new schedule the Cleveland base is placed \$1 a ton over the Pittsburgh base. The new Chicago quotation represents an advance of \$2 to \$3 a ton. Prices at the several points are subject to freight equalization. Makers of cap and set screws also have announced an advance effective Nov. 1, chiefly because recent prices have not yielded a fair profit. Bolts and nuts are in good demand and prices are firm. Prices and discounts are given on page 1221.

Coke and Coal.—Although there has been some abatement of the Eastern demand for beehive oven coke as a substitute for hard coal, it has been sufficient to send prices of run-of-oven 48-hr. coke up another dollar a ton, raising the market to \$8.50 to \$9 per net ton at ovens. Although there is not much blast furnace or foundry demand for coke, some efforts on the part of pig iron producers to determine what they would have to pay for coke if they wanted additional tonnages disclosed no lower prices than coke producers can get in the East for coke for domestic purposes. As much as \$10 is reported to have been paid for beehive oven coke crushed to domestic sizes. The high levels attained by coke are directing attention to soft coal as a substitute for anthracite and there has been a very active market lately in the prepared sizes. There is not much change in prices on mine run coal, but the market is stronger in tone. Prices are given on page 1221.

Old Materials.—This market is stronger. Purchases of heavy melting steel by two Pittsburgh district steel companies with rather exacting specifications amounted to at least 30,000 tons, and have established the market on that grade at \$19 to \$19.50. The market is looking up on other grades. Betterment in railroad equipment buying and inquiry has stimulated interest in the market by steel foundries, and the strength of the pig iron market has been reflected back to cast scrap. While not very active in this area cast scrap is not offered at all freely, as it is wanted in other centers at better prices than can be obtained here. Blast furnace buying has stiffened prices of mixed borings and turnings, which for the first time in several weeks are commanding as much as machine shop turnings and cast iron borings.

The Weirton Steel Co. also was a buyer again in the past week, paying \$19 for heavy melting grade, \$18 for compressed sheets and \$17 for bundled sheet scrap. There are now firm bids of \$17 for heavy breakable cast and \$15 for machine shop turnings and cast iron borings, with sellers asking 50c. higher. The November scrap list of the Pennsylvania Railroad contains 38,722 net tons, bids against which close Nov. 4.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton
Heavy melting steel.....	\$19.00 to \$19.50
No. 1 cast, cupola size.....	18.00 to 18.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	20.00 to 20.50
Compressed sheet steel.....	17.50 to 18.00
Bundled sheets, sides and ends..	16.50 to 17.00
Railroad knuckles and couplers..	21.50 to 22.00
Railroad coil and leaf springs... Low phosphorus blooms and billet ends ..	21.50 to 22.00 23.50 to 24.50
Low phosphorus plates and other material ..	22.00 to 22.50
Low phosphorus punchings.....	20.50 to 21.00
Railroad malleable ..	19.00 to 19.50
Steel car axles.....	21.50 to 22.00
Cast iron wheels.....	18.50 to 19.00
Rolled steel wheels.....	21.50 to 22.00
Machine shop turnings.....	15.00 to 15.50
Short shoveling turnings.....	15.00 to 15.50
Sheet bar crops.....	22.00 to 23.00
Heavy steel axle turnings.....	16.50 to 17.00
Short mixed borings and turnings	15.00 to 15.50
Heavy breakable cast.....	17.00 to 17.50
Stove plate	14.00 to 14.50
Cast iron borings.....	15.00 to 15.50
No. 1 railroad wrought.....	15.50 to 16.00
No. 2 railroad wrought.....	19.00 to 19.50

Chicago

Pig Iron Advances 50c.—Heavy Gain in Mill Bookings

CHICAGO, Oct. 27.—New business and specifications for heavy finished steel are well in excess of shipments, and deliveries from local mills are slowly but surely backing up. October has stepped to the front with sales approximately 25 per cent and specifications nearly 30 per cent ahead of those for the previous month. This business emanates from diverse sources and is sustained without the support which producers anticipated would come of railroad equipment buying. An unusual situation in the market is the persistent demand from the automobile industry which, instead of slackening as winter approaches, has actually released heavier steel specifications for November than it did for October. One maker of parts is taking nearly 10,000 tons of strip steel a month. Agricultural implement makers are also unusually busy and are said to be enjoying the best fourth quarter business since 1920.

The Southern Railway has closed for 39,000 tons of rails with the Tennessee Coal, Iron & Railroad Co. and 2000 tons with the Illinois Steel Co. The Baltimore & Ohio now has an inquiry out for 3,000,000 tie plates. The Central of Georgia has increased its order with the Tennessee Coal, Iron & Railroad Co. to 2000 box cars. The Chicago, Indianapolis & Louisville has ordered 500 underframes from the Pullman Car & Mfg. Co. and the Illinois Central has placed 200 stock cars with the General American Car Co. New inquiries for the week include 1000 gondola cars for the New York Central and 250 stock cars for the Missouri Pacific.

Ingot operations remain at 80 per cent. Out of 27 blast furnaces at Gary, South Chicago and Joliet, the Steel Corporation is operating 16. The Inland Steel Co., has had its three stacks in during the year except for time required to make necessary repairs to one of them. The Inland Co. expects to have its fourth stack ready for blowing in shortly after the first of the year. The Youngstown Sheet & Tube Co., has both of its stacks in, and the Wisconsin Steel Co. is blowing three stacks.

Ferroalloys.—Ferromanganese and ferrosilicon are comparatively quiet and prices are unchanged. Spiegeleisen is in greater demand and it is reported that Jackson County material has practically disappeared from the market, and present quotations are on the basis of \$34, base Hazard, or \$41.76, delivered Chicago.

We quote 80 per cent ferromanganese, \$122.56, delivered; 50 per cent ferrosilicon for 1925 delivery, \$85, delivered; spiegeleisen, 18 to 22 per cent, \$41.76, delivered.

Pig Iron.—The local pig iron market is strong at advances made during the week. Northern No. 2 foundry, malleable and high phosphorus are up 50c., and are now quoted at \$22, local furnace. Northern No. 1 has also advanced 50c. and is now held at \$22.50, local furnace. Demand for these grades of iron is insistent, as many foundries are running ahead of their anticipated schedules. Inquiry is broadening and is showing a tendency to extend not only into the first quarter of the coming year but in some instances to the end of the first half of 1926. Sales for the first quarter are being made on the basis of the new prices. Sellers, however, do not appear to be anxious to book tonnage for next year. Two Chicago melters bought 1300 tons of malleable last week and 1000 tons went to a Milwaukee user. A stove maker in northern Illinois is inquiring for 1400 tons of foundry, and 5000 tons are being sought by Illinois and Michigan melters. Malleable is also in good demand with 5000 tons pending in the Chicago district. An Iowa user wants 300 tons of malleable and a Milwaukee user is inquiring for 500 tons of foundry iron. Charcoal iron is firm and sales were in good volume for the week. Southern iron has advanced from \$19.50 to \$21, base, Birmingham. Adding the all rail freight of \$6.01 brings the

all rail delivered price to \$27.01. The rail and barge rate is \$4.18, thus making the price delivered at Chicago \$25.18. Chicago district users have bought about 500 tons of Southern iron during the week. October shipments of iron will aggregate about 10 per cent better than for September, thus making the month just closing the best of the year.

Quotations on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	\$22.00
Northern No. 1 foundry, sil. 2.25 to 2.75	22.50
Malleable, not over 2.25 sil....	22.00
High phosphorus	22.00
Lake Superior charcoal, averaging sil. 1.50 delivered at Chicago	29.04
Southern No. 2 (all rail).....\$26.01 to 27.01	
Southern No. 2 (barge and rail) 24.18 to 25.18	
Low phosph., sil. 1 to 2 per cent copper free	31.20 to 31.60
Silvery, sil. 8 per cent.....	33.29
Ferrosilicon, 14 to 16 per cent....	45.25 to 45.75

Plates.—It is generally estimated that not less than 15,000 tons of plates will be required for oil storage tanks to be built in the Southwest. Chicago district fabricators state that the bulk of the pending business consists of a comparatively large number of small tonnage inquiries and that the tanks are for the most part of small capacity. Local steel producers estimate that about 10,000 cars are now on inquiry for which they will be called upon to furnish steel when contracts are finally placed. Mills received inquiries this week for steel required for 200 flat cars recently placed by the Illinois Central with the Standard Steel Car Co., and for 50 box car bodies awarded to the Ryan Car Co. by the Litchfield & Madison Railroad. In general, plates are not in as active demand as are the other heavy finished steel products, although mills report that deliveries on plates for certain specific uses are not better than the second week in December. Requirements of automobile manufacturers are still an important factor, taking a good tonnage in light plates. Mill prices are firm at 2.10c., Chicago.

The mill quotation is 2.10c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Bars.—It is now certain that shipments of soft steel bars for October will run well ahead of those for September. Bookings have also been on the increase, and local consumers now find that an average delivery of six weeks is about the best that can be expected. Soft steel bars are firm at 2.10c., Chicago. Business in rail steel bars at less than 2c., base, Chicago Heights mills, has practically disappeared and this commodity is now quoted at 2c. to 2.10c., delivered, Chicago. Re-rolled reinforcing bar users, farm implement manufacturers and makers of fence posts are drawing heavily on this product and forcing the continuation of double turn operations at several of the mills. One producer states that he is booked for the remainder of the year. A slight improvement has again been shown in both orders and specifications for bar iron. Prices are steady at 1.90c. to 2c., Chicago.

Mill prices are: Mild steel bars, 2.10c.; common bar iron, 1.90c. to 2c., Chicago; rail steel bars, 2c. to 2.10c., Chicago.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.60c. for rounds and hexagons and 4.10c. for flats and squares; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c.

Wire Products.—With October rapidly coming to a close, it is found that the month has shown some improvement over September both in specifications against existing contracts and in new business booked. Business is well diversified and is emanating from practically all parts of the country. Manufacturers evidently consider this as an opportune time to replenish stocks and are specifying more liberally. Demand for plain wire has shown the greatest improvement during the past week. Mill operations are unchanged at about 65 per cent, this being an average for all departments, some of which are said to be operating as low as 50 per cent while others are just meeting the demand

when operating at 100 per cent. Mill prices, which are unchanged, are given on page 1220.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, \$3.05 per 100 lb.; common wire nails, \$3.15 per keg; cement-coated nails, \$2.15 to \$2.20.

Rails and Track Supplies.—The Missouri Pacific has contracted for 40,000 tons of rails, although as yet no announcement of the distribution has been made. The Chicago, St. Paul, Minneapolis & Omaha will close this week for approximately 8000 tons. Rail producers now expect that when the Santa Fe enters the market it will be for not less than 100,000 tons. The Chicago & Alton is at work on its 1926 rail budget and will make inquiry within the next two weeks. The Rock Island Lines have so far remained out of the market although the trade anticipates that it will not be long before it will make its requirements known. Track fastenings are moving in good volume and as a general rule are going with the rails.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, 1.80c. to 1.90c., f.o.b. maker's mill.

Standard railroad spikes, 2.90c. to 3c., mill; track bolts with square nuts, 3.90c. to 4c., mill; steel tie plates, 2.25c. to 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.55c., base, and track bolts, 4.55c., base.

Sheets.—Demand for sheets has been gradually increasing from week to week since early in July. Buyers are now placing their specifications from 30 to 40 days and in some cases 60 days before the date of shipment. In the local market blue annealed sheets are firm at 2.40c., Chicago district mill. Galvanized sheets have advanced under the influence of a steady market and the increased price of spelter and are now quoted at 2.40c. to 2.50c., Chicago district mills.

Chicago delivered prices from mill, 3.30c. to 3.35c. for No. 28 black, 2.45c. for No. 10 blue annealed and 4.45c. to 4.55c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.50c. base for blue annealed, 4c. base for black, and 5c. base for galvanized.

Structural Material.—The building industry is still having an important bearing upon the demand for steel. Chicago building permits for the first nine months of 1925 totaled \$50,000,000 above those of the corresponding period of last year. Structural awards for the week aggregated more than 15,000 tons and new inquiries for projects of 500 tons and over will place another 7000 tons before the trade.

The mill quotation on plain material is 2.10c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Reinforcing Bars.—The outstanding award of the week was 2000 tons placed with the Kalman Steel Co. by the Mid-Continent Construction Co., which was the successful bidder on five additional sections of Chicago's double decking program for South Water Street. The number of lettings was comparatively small and new inquiries were fewer than during the previous week. Whether or not this presages a let-up because of the advancing winter season remains to be seen, for the fact remains that there are many pending projects, representing a large tonnage in the aggregate.

Among the leading jobs before the trade are 1300 tons for the Grant Park Stadium, Chicago; 900 tons for Lloyd's Theater, South Bend, Ind.; 1100 tons for the American Bank Note Co. Building, Chicago, and three apartment and hotel structures which will require about 800 tons each. The warehouse price of billet steel reinforcing bars is still 2.60c., Chicago.

Lettings include:

Stratler Garage Corporation, 2515 North Clark Street, Chicago, 100 tons rail steel to the Calumet Steel Co.

Packard Motor Co., Evanston, Ill., garage, 100 tons to Calumet Steel Co.

Sections 5B, 6, 7, 8 and 9 of the double decking of South

Water Street, Chicago, 2000 tons to Kalman Steel Co.

State highway bridge, near Chicago Heights, Ill., 120 tons to Olney J. Dean & Co.

Pending work includes:

Eitel Brothers Hotel, Delaware and Cass Streets, Chicago, 130 tons.

Woodruff Ice & Cold Storage Co., Peoria, Ill., 100 tons.

Hewitt & Emerson, architects.

Apartment building, 1320 North State Street, Chicago, 600 tons. R. DeGolyer, architect.

Seneca Hotel, Chicago, 800 tons. General contractors, Paschen Brothers.

Bolts, Nuts and Rivets.—Bolt and nut makers con-

tinue to receive liberal specifications from automobile manufacturers, implement makers, the railroads and miscellaneous consumers. It is now definitely established that October will compare favorably in both volume of specifications and shipments with either August or September. Operations of bolt makers are holding steadily at 70 per cent, although several individual plants are operating above that rate. The market is steady and prices and discounts are unchanged.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to $\frac{1}{2}$ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to $\frac{1}{2}$ x 4 in., 50 off; larger sizes, 50 off; hot-pressed nuts, squares, tapped or blank, \$3.50 off; hot-pressed nuts, hexagons, tapped or blank, \$4 off; coach or lag screws, 60 per cent off.

Cast Iron Pipe.—On the general run of business, ruling quotations on cast iron pipe are \$41 to \$42, base Birmingham, for 6-in. and larger sizes, although the higher quotation is becoming more common. Makers state that they are definitely sold to the first week in December. No large awards were made during the week, although the volume of business was well sustained through the placing of a considerable number of small tonnage jobs. James B. Clow & Sons have taken 300 tons of 6-in. Class B for Connerville, Ind. Muskegon, Mich., will take bids on 450 tons of 6-in. Class B. Bids will be opened on Oct. 30, on the Clarendon Hills, Ill., inquiry for 1100 tons.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$53.20 to \$54.20; 6-in. and over, \$49.20 to \$50.20; Class A and gas pipe, \$4 extra.

Coke.—Foundry coke is unchanged at \$10.75, delivered in the Chicago switching district. The schedule of price advances on crushed coke made during the summer was not extended beyond Oct. 1, and users are curious to know whether or not present prices will hold into November.

Old Material.—The past week has been a quiet one and, although some grades have shown a fair degree of activity, it has been confined almost wholly to steel commodities. The situation seems to have reached a balance, wherein tonnage appearing on track is just about sufficient to meet the current demand. A few small tonnage sales of heavy melting steel are reported at \$16.25, and No. 1 wrought, which is in fair demand, has moved rather freely within a spread of \$15 to \$15.50. Dealers are said to have their yards well stocked, and they are not inclined to burden themselves with additional tonnage at this time. Railroad lists include: Missouri-Kansas-Texas, 2000 tons; Chicago, Milwaukee & St. Paul, 4000 tons; the Big Four, 4300 tons, and the Chicago, Burlington & Quincy, 5900 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

	Per Gross Ton
Iron rails	\$18.00 to \$18.50
Cast iron car wheels	18.00 to 18.50
Relaying rails, 56 lb. to 60 lb.	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Forged steel car wheels	19.50 to 20.00
Railroad tires, charging box size	19.25 to 19.75
Railroad leaf springs, cut apart	19.50 to 20.00
Rails for rolling	19.25 to 19.75
Steel rails, less than 3 ft.	19.50 to 20.00
Heavy melting steel	16.00 to 16.50
Frogs, switches and guards, cut apart	17.75 to 18.25
Shoveling steel	15.75 to 16.00
Drop forge flashings	12.00 to 12.50
Hydraulic compressed sheets	14.00 to 14.50
Axle turnings	14.50 to 15.00
Steel angle bars	18.75 to 19.25
Steel knuckles and couplers	18.75 to 19.25
Coil springs	19.50 to 20.00
Low phos. punchings	18.00 to 18.50
Machine shop turnings	9.50 to 10.00
Cast borings	12.75 to 13.25
Short shoveling turnings	12.75 to 13.25
Railroad malleable	18.50 to 19.00
Agricultural malleable	18.00 to 18.50

	Per Net Ton
Iron angle and splice bars	18.25 to 18.75
Iron arch bars and transoms	26.50 to 27.00
Iron car axles	17.50 to 18.00
No. 1 busheling	12.50 to 13.00
No. 2 busheling	9.00 to 9.50
Pipes and flues	11.00 to 11.50
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	14.25 to 14.50
No. 1 machinery cast	18.00 to 18.50
No. 1 railroad cast	16.75 to 17.25
No. 1 agricultural cast	16.75 to 17.25
Locomotive tires, smooth	16.50 to 17.00
Stove plate	14.75 to 15.25
Grate bars	14.50 to 15.00
Brake shoes	14.25 to 14.75

Cincinnati

Rise in Pig Iron Brings Out Buying— Large Coke Sales

CINCINNATI, Oct. 27.—Interest in pig iron has been well sustained during the past week and sales have approximated 22,000 tons. With furnaces well fortified with commitments through the rest of the year and prices steadily advancing, consumers are rushing to purchase their first quarter needs. Producers in the Ironton district have established \$20, base furnace, as the minimum quotation on large as well as small lots. Several attractive tonnages have been booked at that figure and in at least one case an Ironton furnace obtained \$21 for delivery in nearby territory. A seller who has recently taken considerable business, is unwilling to book tonnage at less than \$20.50, furnace. Alabama iron is quoted at \$20 to \$22, base Birmingham. It is impossible to sell much iron at that price in competition with Northern furnaces, although considerable activity is noted in southern Indiana. Sales of Tennessee iron have been limited to minor transactions at \$19, base Birmingham. Silvery prices show strength and buyers are manifesting more interest in silvery grades. A southern Ohio consumer has taken 3500 tons of Northern foundry, while a Dayton, Ohio, melter placed an order for 1400 tons.

Malleable sales include 2000 tons to a southern Ohio melter and 1000 tons to an Indiana manufacturer. The prevailing price on malleable iron is \$20 to \$20.50, Ironton, although it is still possible to shade the former quotation when a large lot appears. The Cadillac Motor Co. has purchased 1000 tons of silvery. The present buying movement is likely to continue, judging by the number of inquiries. The Buick Motor Car Co., Flint, Mich., is in the market for 21,000 tons of foundry and malleable grades for first quarter delivery. A southern Ohio melter is inquiring for 1000 tons of charcoal iron, while the Lunkenheimer Co., Cincinnati, is asking for 600 tons of Northern and Southern iron. A local broker has sold 200 tons of Bessemer ferrosilicon.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	\$24.05
Alabama fdy., sil. 2.25 to 2.75...	24.55
Tennessee fdy., sil. 1.75 to 2.25...	23.05
Southern Ohio silvery, 8 per cent 2.25	30.77
Southern Ohio fdy., sil. 1.75 to 2.25	\$22.27 to 22.77
Southern Ohio, malleable.....	22.02 to 22.77

Sheets.—Buying is steadily gathering momentum and many consumers are closing for their requirements during the remainder of the year. Mills are refusing to book business at the low prices which have prevailed recently and present indications point to a strong effort to raise quotations \$1 to \$2 a ton on all classes of sheets. There is better demand for black sheets, which are selling at 3.15c., Pittsburgh, with at least one producer quoting 3.25c. It is impossible to secure galvanized sheets under 4.30c., Pittsburgh, and several mills are asking 4.40c. Automobile sheets have advanced to 4.40c., Pittsburgh, with consumers pressing mills for quick deliveries. Blue annealed sheets are firm at 2.30c., Pittsburgh. Several inquiries for first quarter have been received, but mills are reluctant to book orders for that delivery at present prices.

Bars, Plates and Shapes.—Sellers are pleased with the tone of the market and state that business has been fairly good. With few exceptions orders have been confined to small lots. Sales of bars have been moderate in volume with the market firm at 2c., Pittsburgh. Plate quotations range from 1.80c. to 1.90c., Pittsburgh, and mills admit that they are unable to eliminate the lower price. The Big Four Railroad has purchased 1400 tons of plates from the Jones & Laughlin Steel Corporation, while the Louisville & Nashville has bought 780 tons of plates from a Southern producer. Shapes are in fair demand at 1.90c. to 2c., Pittsburgh. Fabricators are busy on many small jobs, but the number of large projects is considerably below normal.

Wire Goods.—Sellers report that demand for fencing

and other wire products from rural districts has been fairly active. There is no change in the prices on wire nails and plain wire in Cincinnati and other Ohio River points. An independent Ironton mill is holding to a delivered price of \$2.65 per keg on common wire nails, but the transportation cost to the consumer in hauling goods from the river bank to the final destination is said to be approximately 10c., making the price delivered in the jobbers' warehouses \$2.75. Eastern mills are quoting prices which range from \$2.75 to \$2.94, delivered here. The Ironton producer will take orders for plain wire at \$2.54 per 100 lb., delivered Cincinnati. None of the Eastern sellers will meet that price, although several will go as low as \$2.59, which figures back to \$2.30, Pittsburgh.

Reinforcing Bars.—The Bourne-Fuller Co. will supply 400 tons for the new warehouse of the Kroger Grocery & Baking Co. at Columbus, Ohio, and 250 tons for a new building for the *Cincinnati Enquirer*, Cincinnati. The Safe Cabinet Co., Marietta, Ohio, has awarded approximately 600 tons for its factory to the Kalman Steel Co. The Ferro Concrete Construction Co., Cincinnati, has purchased 125 tons for an addition to the plant of the American Laundry Machinery Co., Cincinnati, from the Pollak Steel Co., and will take the rest of the requirements from stock. Prices are showing strength, with new billet bars firm at 2c., Cleveland, and rail steel bars at 1.90c., mill.

Warehouse Business.—While there is a pronounced demand for bars, structural shapes and plates are less active because unfavorable weather has retarded construction work. Sales of sheets have increased, according to several jobbers. No change has occurred in prices.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4c. to 4.25c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds and hexagons, 3.85c.; squares, 4.35c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.10c.; No. 28 galvanized sheets, 5.25c.; No. 9 annealed wire, \$3 per 100 lb.; common wire nails, \$2.95 per keg base; cement coated nails, \$2.40 per keg; chain, \$7.55 per 100 lb. base; large round head rivets, \$3.75 base; small rivets, 65 per cent off list. Boiler tubes: prices net per 100 ft. lap welded steel tubes, 2-in., \$18; 4-in., \$38; seamless, 2-in., \$19; 4-in., \$39.

Coke.—It is anticipated that producers of by-product foundry coke will raise their schedule 50c. on Nov. 1, making a delivered price in Cincinnati of \$10.14. Dealers expect an advance of \$1 on domestic grades, thus establishing a price of \$8.14, delivered here. Connellsville foundry coke has soared to \$12.53, delivered, and dealers are experiencing difficulty in obtaining coke from that district. A local dealer has sold 7000 to 10,000 tons of Wise County foundry coke to a Wisconsin consumer. Another sale of 4000 tons of furnace coke for domestic use is noted.

Based on freight rates of \$2.14 from Ashland, Ky., \$3.53 from Connellsville, \$2.90 from New River ovens and \$2.59 from Wise County ovens, we quote f.o.b. Cincinnati: Connellsville foundry, \$12.53; Wise County foundry, \$8.09 to \$9.09; New River foundry, \$10.40; by-product foundry, \$9.64.

Old Material.—Mills have resumed purchasing small quantities of scrap and dealers believe that freer buying will develop in the next 30 days. Prices are holding up well.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton		
Heavy melting steel.....	\$14.00	to \$14.50
Scrap rails for melting.....	14.00	to 14.50
Short rails	18.00	to 18.50
Relaying rails	28.00	to 28.50
Rails for rolling.....	15.00	to 15.50
Old car wheels.....	13.50	to 14.00
No. 1 locomotive tires.....	16.50	to 17.00
Railroad malleable	15.50	to 16.00
Agricultural malleable	15.00	to 15.50
Loose sheet clippings.....	9.50	to 10.00
Champion bundled sheets.....	11.50	to 12.00

Per Net Ton		
Cast iron borings.....	8.50	to 9.00
Machine shop turnings.....	7.50	to 8.00
No. 1 machinery cast.....	19.00	to 19.50
No. 1 railroad cast.....	15.00	to 15.50
Iron axles	23.00	to 23.50
No. 1 railroad wrought.....	11.50	to 12.00
Pipes and flues.....	8.50	to 9.50
No. 1 busheling.....	10.50	to 11.00
Mixed busheling	9.00	to 9.50
Burnt cast	9.50	to 10.00
Stove plate	10.50	to 11.00
Brake shoes	10.50	to 11.00

San Francisco

Inquiries Increase but Buying Is Confined to Small Tonnages

SAN FRANCISCO, Oct. 24 (By Air Mail).—While the number of inquiries, in some respects, has shown a slight gain, the volume of business closed during the week has been disappointing. However, numerous small tonnages are being placed in nearly all departments of the market, particularly in structural material, plates, bars and pig iron. Prices generally are slightly firmer, and there is undoubtedly less price shading today than has been the case in several weeks.

Hearings are still being held in Sacramento on the petition of the East Bay Municipal Utility District for a permit to tap the waters of the Mokelumne River. The proceedings have become involved in technicalities on water rights, but at the office of the District in Oakland, it is expected that a permit will be issued before the end of the month, so that construction work may be started early in November as scheduled.

Pig Iron.—The inquiry for 1000 tons of foundry iron reported a week ago has not yet been closed. In view of the recent upward movement of Eastern prices, it would not be surprising if higher price levels were put into effect locally.

*Utah basic	\$27.00 to \$28.00
*Utah foundry, sli. 1.75 to 2.25	27.00 to 28.00
**English foundry	26.00
**Belgian foundry	24.50 to 25.00
**Dutch foundry	24.00
**Indian foundry	24.00 to 25.00
**German foundry	25.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—Only two construction jobs calling for more than 100 tons are known to have been closed during the week. The larger of these, 1100 tons, for the Aronson Building, San Francisco, was taken by the Pacific Rolling Mill Co., Inc. The Schrader Iron Works was awarded 196 tons for an apartment house on Green and Buchanan Streets. The only job of any size that has come up is a theater to be erected on Fillmore and California Streets, which calls for about 200 tons. Eastern mill prices on plain material are firm at 2.30c. to 2.35c., c.i.f., Coast ports.

Plates.—Prices quoted by Eastern mills continue to hold firmly at 2.25c. to 2.30c., c.i.f. Coast ports, and it is doubtful if anything except a very desirable tonnage could be placed under the minimum of 2.25c. A steam power plant, known as Unit No. 1, to be built by the city of Los Angeles and calling for 150 tons of plates and 250 tons of tubes, is being bid on in the South, and awards are expected to be made within the next week or ten days. A referendum will be held in Marin County on Oct. 29, to vote on bonds for the construction of a water supply system for the cities of the county, which will require about 1000 to 1500 tons of plates for a pipe line. An inquiry from an unnamed oil company calls for about 425 tons for tank work.

Bars.—Competition remains keen in the local reinforcing bar market, and jobbers' prices are more or less nominal at 2.75c. to 3.25c., base, per lb., for carload lots. A fair volume of business is being booked, but most of it consists of small tonnages. A local jobber, however, has taken 500 tons for the Leamington Hotel, Nineteenth and Franklin Streets, Oakland, but this is the only job calling for 100 tons or more that is known to have been closed during the week.

Rails and Track Supplies.—The Southern Pacific Co. is inquiring for about 1500 kegs of track bolts, and 1,500,000 tie plates. The Key System Transit Co., Oakland, Cal., has placed 100 tons of 70-lb. rails with the United States Steel Products Co., and is inquiring for about three carloads of track specialties. The Los Angeles Railroad Co. is understood to have placed 1200 tons of 116-lb. girder rails, 250 kegs of track spikes and 70 tons of tie plates with an Eastern mill.

Warehouse Business.—Sales since Labor Day have shown an improvement of about 25 per cent over busi-

ness transacted during September and October of last year. While orders are for the most part individually small, the volume is good, and prices are slightly firmer. Some of the local jobbers say that there are few indications of price shading, and that the market is more stable than it has been in several weeks.

Merchant bars, \$3.30 base, per 100 lb.; merchant bars, $\frac{3}{4}$ in. and under, rounds, squares and flats, \$3.80 base, per 100 lb.; soft steel bands, \$4.15 base, per 100 lb.; angles, $\frac{1}{4}$ in. and larger x $1\frac{1}{2}$ in. to $2\frac{1}{2}$ in., inc., \$3.30 base, per 100 lb.; channels and tees, $\frac{3}{4}$ in. to $2\frac{1}{2}$ in., inc., \$3.90 base, per 100 lb.; angles, beams and channels, 3 in. and larger, \$3.30 base, per 100 lb.; tees, 3 in. and larger, \$3.30 base, per 100 lb.; universal mill plates, $\frac{3}{4}$ in. and heavier, stock lengths, \$3.30 base, per 100 lb.; spring steel, $\frac{3}{4}$ in. and thicker, \$6.30 base per 100 lb.; wire nails, \$3.50 base, per 100 lb.; cement coated nails, \$3 base, per 100 lb.; No. 10 blue annealed sheets, \$3.85 per 100 lb.; No. 28 galvanized sheets, \$5.90 per 100 lb.; No. 28 black sheets, \$4.80 per 100 lb.

Steel Pipe.—The city of San Francisco is in the market for about 400 to 500 tons of black pipe for the Hetch Hetchy water system. The city of San Bernardino has awarded 90 tons of Matheson pipe to the George M. Cooley Co. and 77 tons of black pipe and eight tons of galvanized pipe to A. H. Bush & Co.

Nails.—The Standard Oil Co. of California is inquiring for 3000 kegs of cement coated nails, which is understood to represent its regular quarterly requirement.

Coke.—Inquiries are mostly for small lots, and even these have been infrequent during the past week. Prices quoted by local importers are firm but unchanged.

English beehive, \$15 to \$16 at incoming dock, and English by-product, \$12 to \$14; German by-product, \$11.50 to \$12.

Old Material.—While there is a slightly stronger interest being shown in scrap, there has been little large buying. Prices are steady.

Prices for scrap delivered to consumers' yards are as follows:

Per Gross Ton
No. 1 heavy melting steel.....\$11.50 to \$12.00
Scrap rails, miscellaneous.....11.50 to 12.00
Rolled steel wheels.....11.50 to 12.00
Couplers and knuckles.....11.50 to 12.00
Mixed borings and turnings.....6.00 to 6.50
Country mixed scrap.....8.00 to 8.50
No. 1 cast scrap.....19.50 to 20.00

St. Louis

Pig Iron Advances as Demand Increases —Heavy Coke Sales—Scrap Strong

ST. LOUIS, Oct. 27.—Sales of pig iron during the week amounted to about 15,000 tons. Of this, 10,000 tons was of Southern make from both Alabama and Tennessee furnaces. The St. Louis Coke & Iron Co. has opened its books for first quarter shipment, but has sold sparingly, limiting commitments to regular customers. Its price is now \$23, f.o.b. Granite City. Much of the current business is coming from stove foundries here and in Belleville. The Commonwealth Steel Co. has increased its furnace operations from one to two. Other melters in the district report improved business, and there are many requests for shipments ahead of schedule. Pending inquiries total about 1500 tons. The market is firm, with Northern iron at \$21.50, base Chicago, and Southern \$19 to \$20, base Birmingham.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sli. 1.75 to 2.25	\$23.66
Northern malleable, sli. 1.75 to 2.25	23.66
Basic	23.66
Southern fdy., sli. 1.75 to 2.25	\$24.17 to 25.17
Granite City iron, sli. 1.75 to 2.25	23.81

Finished Iron and Steel.—The Wabash Railway has issued an inquiry for 15,000 tons of 90-lb. A. R. A. rails. Work has commenced on the Garment Center Building, which will require about 650 tons of reinforcing bars. Orders from jobbers and manufacturing users of steel

are still small, but more frequent. The outlook is for more active buying between now and the first of the year.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.25c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, cold rolled, one pass, 4.50c.; galvanized sheets, No. 28, 5.50c.; black corrugated sheets, 4.65c.; galvanized, 5.65c.; cold-rolled rounds, shafting and screw stock, 3.75c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, $\frac{1}{8}$ in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, \$3.50; hexagons, blank or tapped, \$4 off list.

Coke.—Demand for domestic grades of coke took a marked spurt during the week. The St. Louis Coke & Iron Co. sold about 50,000 tons, the largest single order being for 10,000 tons. Buying was for immediate shipment. This and a more active demand for foundry grades will greatly diminish the company's piles.

Old Material.—Old material has made further advances during the week. An East Side melter bought 3000 tons of shoveling steel and melting steel from three dealers. A leading West Side consumer is now negotiating for a round tonnage, but it and the dealers are said to be far apart on the question of price. There is a good demand for relaying rails, and one dealer sold 800 tons of 60-lb. rails to a saw mill. Railroad lists include: Chicago, Milwaukee & St. Paul, 2000 tons; Canadian National, 3000 tons; Chicago, Burlington & Quincy, 6000 tons; Frisco, 700 tons, and Union Pacific, 1200 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

	Per Gross Ton
Iron rails	\$15.00 to \$15.50
Rails for rolling	19.00 to 19.50
Steel rails less than 3 ft.	18.50 to 19.00
Relaying rails, 60 lb. and under	24.00 to 24.50
Relaying rails, 70 lb. and over	30.00 to 31.00
Cast iron car wheels	17.50 to 18.00
Heavy melting steel	15.75 to 16.25
Heavy shoveling steel	15.75 to 16.25
Frogs, switches and guards cut apart	18.00 to 18.50
Railroad springs	19.00 to 19.50
Heavy axles and tire turnings	13.50 to 14.00
No. 1 locomotive tires	16.50 to 17.00
	Per Net Ton
Steel angle bars	14.75 to 15.25
Steel car axles	18.00 to 18.50
Iron car axles	24.50 to 25.00
Wrought iron bars and transoms	19.00 to 19.50
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	14.00 to 14.25
Cast iron borings	11.25 to 11.50
No. 1 busheling	12.50 to 13.00
No. 1 railroad cast	15.50 to 16.00
No. 1 machinery cast	17.00 to 17.50
Railroad malleable	14.00 to 14.50
Machine shop turnings	8.50 to 9.00
Bundled sheets	9.00 to 9.50

Boston

Pig Iron Sales Gain and Foundry Coke Advances—Scrap Stronger

BOSTON, Oct. 27.—Although not active in the same sense as a month or so ago, pig iron sales show a notable gain. Most of the present buying, like recent purchases, is in comparatively small tonnages by foundries who were and are not fully covered for the first quarter. Their activity has been prompted by the belief that prices will probably be higher before they are lower, owing to the fuel situation. Buying centers largely in Buffalo district, western Pennsylvania and foreign iron, with prices on all three higher. Sales of Buffalo No. 2X iron were made this week at \$26.41, delivered, representing an extreme advance during the past fortnight of \$1.50 a ton. Instead of the usual 50c. a ton differential between prices on No. 2X and No. 1X, furnaces are asking and securing a \$1 differential. Western Pennsylvania No. 2X for first quarter delivery is quoted at \$25.91, delivered, or 50c. higher than for November and December delivery. Western Pennsylvania No. 3 iron was sold during the past week at \$19.50, furnace. Very little of this iron is ordinarily sold in New England. Indian iron is now quoted at \$22 on dock Boston duty paid, an advance of \$1 a ton, and Dutch and Continental irons are bringing as much or

a shade more. Almost no eastern Pennsylvania iron is available here.

We quote delivered prices on the basis of the latest sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25.....	\$24.65 to \$25.15
East. Penn., sil. 2.25 to 2.75.....	25.15 to 25.65
Buffalo, sil. 1.75 to 2.25.....	25.91
Buffalo, sil. 2.25 to 2.75.....	26.41
Virginia, sil. 1.75 to 2.25.....	28.92 to 29.42
Virginia, sil. 2.25 to 2.75.....	29.42 to 29.92
Alabama, sil. 1.75 to 2.25.....	29.60
Alabama, sil. 2.25 to 2.75.....	30.10

Cast Iron Pipe.—Beverly and Attleboro, Mass., have each purchased approximately 100 tons of 6-in. pipe from the Warren Foundry & Pipe Co., these being the only municipal lettings the past week. Numerous municipalities are sounding out the market, however, and presumably will place orders for pipe needed next spring around the middle of November. Foundries are in a fairly comfortable position on small pipe business and prices for such material are firm. Large pipe is soft, however, and it is possible to secure price concessions of as much as \$1.50 a ton on some sizes. The gas pipe market is quiet. Prices quoted openly on cast iron pipe follow: 4-in., \$60.10 a ton, delivered at Boston common freight rate points; 6-in. to 16-in., \$56.10; 20-in. and larger, \$55.10.

Shapes and Plates.—Domestic shapes are offered here at 2.265c. to 2.365c. per pound delivered, or 1.90c. to 2c. base Pittsburgh. Foreign material of standard American specifications is offered by Continental mills, f.o.b. Boston dock duty paid, at prices below the equivalent of 1.90c. to 2c. at Pittsburgh. The ruling market on domestic plates is 2.065c. delivered, or 1.70c. base Pittsburgh, but less than that has been done recently.

Coke.—Reflecting the growing acuteness of the coke situation, the New England Coal & Coke Co. has advanced by-product foundry coke \$1 a ton to \$13, delivered, where the freight rate does not exceed \$3.10 a ton. For shipments outside the \$3.10 freight zone, that company is asking premiums. The Providence Gas Co. has advanced foundry coke 50c. a ton to \$12.50, delivered. Neither company has advanced domestic coke notwithstanding they are far behind on deliveries. During the past week Connellsville district domestic coke has been sold in New England at \$15.54 a ton, delivered, or \$10 on cars at ovens, a new high price for that fuel. Connellsville ovens are restricting shipments of stove and nut coke.

Old Material.—Business in old material slowed up the past week. Holders of material are now reluctant to sell, as an advance of 50c. to \$1 a ton in bids for heavy melting steel and scrap rails has created expectations of a general advance in brokers' quotations. The strength of the pig iron market also has made holders of scrap chary about selling. Although price details are withheld, it is generally conceded that buyers' bids were rather high on material recently offered by various railroads. A Canadian firm is in the market for 4000 to 5000 tons of scrap rails and has bid considerably above the prevailing market here without obtaining material.

The following prices are for gross ton lots delivered consuming points:

Textile cast	\$20.00 to \$20.50
No. 1 machinery cast	19.50 to 20.00
No. 2 machinery cast	15.50 to 16.50
Stove plate	13.50 to 14.25
Railroad malleable	19.00 to 19.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	\$11.50 to \$12.50
No. 1 railroad wrought	12.50 to 13.00
No. 1 yard wrought	11.50 to 12.00

Wrought pipe (1 in. in diameter, over 2 ft. long)	11.50 to 12.00
Machine shop turnings	9.00 to 9.50

Cast iron borings, chemical	11.50 to 12.00
Cast iron borings, rolling mill	9.00 to 9.50

Blast furnace borings and turnings	8.50 to 9.00
Forged scrap	9.00 to 9.50

Bundled skeleton, long	9.00 to 9.50
Forged flashings	9.50 to 10.00

Bundled cotton ties, long	9.50 to 10.00
Shaftings	10.00 to 10.50

Street car axles	18.00 to 18.50
Rails for rerolling	13.00 to 13.50

Scrap rails	12.50 to 13.00
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Buffalo

Pig Iron Continues Advance—New Sheet Mills Start—Heavy Scrap Buying

BUFFALO, Oct. 27.—The market seems to be strong at \$20 to \$20.50 for current delivery and \$21 for the first quarter. Some furnaces are obtaining the full differential of 50c. for No. 2X and \$1 for No. 1 foundry, and others are getting only the 50c. differential on both grades. But the fact remains that the market has stiffened. One producer is quoting \$20.50 but expects to retire from the market within a short time. An order of over 1000 tons of malleable was booked for west of Buffalo delivery and other sizable sales are reported. Between 15,000 and 20,000 tons is pending, including one inquiry for 1250 tons of foundry and another for 1500 tons of the same grade. A sale of 3000 tons of foundry within the past two weeks is noted.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil.	1.75 to 2.25	\$20.00 to \$21.00
No. 2X foundry, sil.	2.25 to 2.75	20.50 to 21.50
No. 1 foundry, sil.	2.75 to 3.25	21.00 to 22.00
Malleable, sil. up to 2.25	20.00 to 21.00	
Basic	19.50 to 20.00	
Lake Superior charcoal	29.28	

Finished Iron and Steel.—By the end of the week the Seneca Iron & Steel Co.'s six new mills will be on and the plant will be running at full capacity. All of the company's 18 hot mills are understood to be booked until February. Sheets are unchanged at 3.15c., Pittsburgh, for black and 4.30c. for galvanized. Warehouse business throughout the month of October has been holding up well, particularly in small bars and shapes. Reinforcing bars also are in strong demand, but not much structural work has been booked. The Fort Pitt Bridge Works has taken 600 tons for an addition to the Buffalo plant of the General Electric Co. Bars and shapes are firm at 2.265c. and 2.165c., Buffalo, respectively.

Warehouse prices are being quoted as follows: Steel bars, 3.25c.; steel shapes, 3.35c.; steel plates, 3.35c.; No. 10 blue annealed sheets, 3.80c.; No. 28 black sheets, 4.75c.; No. 28 galvanized, 5.45c.; cold rolled shapes, 4.40c.; cold rolled rounds, 3.95c.; wire nails, 4c.; black wire, 4.05c.

Old Material.—The market during the past week was featured by the purchase of an aggregate of 15,000 tons of heavy melting steel by two of the principal mills. One mill bought about 5000 tons of heavy melting and paid \$18, while another mill with somewhat stricter specifications, purchased 12,000 tons, paying \$18.50 for most of it and \$19 for the remainder. This mill states that its requirements until the first of January have been satisfied. A consumer which buys a special grade of steel for foundry purposes bought at \$19.24. All odds and ends have been picked up and dealers are holding for higher prices. Sales of angle bars and short rails for foundry use have been made at \$20.50. There has been some buying of cast scrap at \$19, following the booking of better business by the gray iron foundries. Purchases of car wheels at Pittsburgh net Buffalo dealers \$16. New factory hydraulic compressed bundled sheets have been sold at \$17.50 and machine shop turnings at \$12.50. The market for machine shop turnings at Pittsburgh and eastern Pennsylvania is strong.

We quote prices f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel	\$18.50 to \$19.00
Low phosphorus	20.00 to 20.50
No. 1 railroad wrought	16.50 to 17.00
Car wheels	16.50 to 17.50
Machine shop turnings	12.00 to 12.50
Cast iron borings	13.00 to 13.50
No. 1 busheling	16.50 to 17.00
Stove plate	15.00
Grate bars	14.50 to 15.00
Hand bundled sheets	13.00 to 13.50
Hydraulic compressed	16.50 to 17.50
No. 1 machinery cast	16.50 to 17.00
Railroad malleable	19.50 to 20.00
No. 1 cast scrap	17.00 to 17.50
Iron axles	26.00 to 27.00
Steel axles	20.00 to 20.50

Birmingham

Pig Iron Stocks Lower—Rolling Mills Behind in Deliveries—Coke Firm

BIRMINGHAM, Oct. 27.—Sales of pig iron in this district exceed output and stocks are consequently being reduced steadily. Two or three sales are reported for amounts in excess of 1500 tons for delivery in 90 days. Probably less iron will be carried over into 1926 than has been estimated. An additional furnace may be blown in on foundry iron within 30 days, in addition to the two furnaces which are being relined. One of these will shortly resume basic iron output; the other will produce foundry iron. The Walworth Mfg. Co., the Wetter Pipe Co. and the Agricola Furnace Heating Co., all of Gadsden, are building plant additions which will mean the consumption of more pig iron in the near future. Additions are also being made to the soil pipe and fitting plants at Anniston. Sales of pig iron continue on the \$20 base for No. 2 foundry, while single car lots command \$21.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil	\$20.00 to \$20.50
No. 1 foundry, 2.25 to 2.75 sil	20.50 to 21.00
Basic	20.00
Charcoal, warm blast	30.00 to 32.00

Rolled Steel.—Production of steel in this district is still close to 95 per cent of capacity. Reports prevail that steel deliveries in the Birmingham district are falling behind. Fabricating plants have enough business in sight to warrant steady plant operation. Local demands keep the smaller plants busy.

Cast Iron Pipe.—Production and shipments are steady. Pressure pipe plants have considerable unfilled tonnage to care for. Shipments to the Northwest continue despite the approach of cold weather and the movement to the South and Southwest is increasing. Recent price advances have not slowed business down and increases in soil pipe quotations have had no effect on output.

Coke.—A better demand for coke is noted and outside consumers are coming into the market. Home consumption is steady. Quotations are firm at \$6 per net ton on foundry coke. The by-product make has been increased, but this is for furnace use in the home territory. The entrance of the Semet-Solvay by-product plant at Ensley into the open market will bring about a material increase in the production of the district. No transportation delay is reported.

Old Material.—The activity continues, much old material being melted. Dealers still are abstaining from taking long time contracts because prices are regarded low, but are shipping in quantity. Heavy melting steel is in most active demand and quotations hold at \$13.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical	\$15.00 to \$16.00
Heavy melting steel	13.00 to 14.00
Railroad wrought	12.00 to 13.00
Steel axles	18.00 to 20.00
Iron axles	17.00 to 19.00
Steel rails	13.00 to 14.00
No. 1 cast	16.00 to 17.00
Tramcar wheels	16.00 to 17.00
Car wheels	15.00 to 16.00
Stove plate	13.00 to 14.00
Machine shop turnings	7.00 to 8.00
Cast iron borings	7.00 to 8.00
Rails for rolling	16.50 to 17.00

To Market Rerolling Billets

The New Process Iron & Steel Co., Noblesville, Ind., expects shortly to put into operation its 24-in. breakdown mill and also a 16-in. finishing mill, and will have billets for sale beyond its own requirements. The rerolling billets for the market will range from 4 to 6 in., and the process at the mills is to start from an all scrap pile weighing 1000 lb. and roll to the required size.

Cleveland

Sales of 50,000 Tons as Pig Iron Advances —Sheets Stronger

CLEVELAND, Oct. 27.—A Valley maker today sold 1000 tons of basic pig iron at \$19, furnace. New demand for finished steel continues in good volume, and some consumers are now beginning to show a disposition to place stock orders. Some inquiry for first quarter contracts is coming out, particularly for steel bars, plates, alloy steel and sheets. However, none of the mills seems ready to book business for that delivery. Mills have accumulated fair backlog, although buyers can still secure good service. On steel bars a number of mills are promising shipments in from three to four weeks. There is a tendency among many producers to take a firmer stand on prices, this being particularly noticeable on plates. As a result of recent locomotive buying and better demand from other sources, several of the plate mills have accumulated considerable business and are trying to bring the plate price up to 1.90c., Pittsburgh. Sales have been made at the advance, although 1.80c. is still the more common quotation. Structural material is firmer and some mills are holding to 2c., Pittsburgh, although 1.90c. is still being quoted on desirable lots. Demand from the automotive industry is well maintained and some of the motor car builders have specified for shipments well into December. However, as it is not expected that the present rate of automobile production can be continued through December, curtailment in the demand from car builders is looked for next month. New railroad orders include four locomotives for the Central of Georgia Railroad placed with the Lima Locomotive Works, Inc. New inquiry is rather light in the structural field.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 3.80c.; No. 28 galvanized sheets, 4.95c.; No. 10 blue annealed sheets, 3c.; cold-rolled rounds and hexagons, 3.80c.; flats and squares, 4.30c.; hoops and bands, 3.85c.; No. 9 annealed wire, \$3 per 100 lb.; No. 9 galvanized wire, \$3.45 per 100 lb.; common wire nails, \$3 base per 100 lb.

Ore.—Some late demand for iron ore is developing. A Pittsburgh steel maker purchased 40,000 tons of Bessemer ore during the week and a late order from the Ford Motor Co. was for approximately 25,000 tons of high phosphorus ore. Another sale made this week calls for 5000 tons of manganese ore.

Pig Iron.—The market continues very active and prices are from 50c. to \$1 a ton higher than a week ago. The coke situation, which is forcing prices up, is driving many consumers to cover for the first quarter. Sales by Cleveland interests during the week aggregated 50,000 tons, and inquiries for nearly as much more are pending. The Buick Motor Co., which recently bought a round tonnage of foundry iron for the fourth quarter, is inquiring for 21,000 tons for the first quarter, this to be additional to the amount that it will receive from its regular source of supply on a long time contract. Considerable inquiry is coming from the stove and furnace manufacturers in Michigan. The McKinney Steel Co. unexpectedly has been forced to blow out one of its Cleveland furnaces for relining. As this was the only furnace that the company was operating on foundry iron, its suspension has caused the McKinney company to withdraw from the market as a seller. This move is expected to result in some shortage of foundry iron in the immediate territory. Foundry and malleable iron have advanced 50c. a ton in Cleveland to \$20.50 at furnace for local delivery. In the Valley district prices have advanced 50c., with \$20 the usual quotation, and very little, if any, iron can be had at \$19.50. Buffalo producers are asking \$20, base, Buffalo, for this year and \$21 for the first quarter. A Detroit maker advanced its price \$1 a ton to \$22, furnace, and reports sales in Michigan aggregating over 5000 tons at that price, although iron is still available at a lower price in that State. The same producer Monday made a further advance to \$23, Detroit. Valley makers quote basic iron from \$19 to \$19.50. Low phosphorus iron has become more active. A Valley producer sold 1500 tons during the week, including 600 tons to a consumer in the Cleveland terri-

tory, and 2000 tons are pending. The market is firmer and \$27.50 is now quoted as the minimum on low phosphorus iron.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6.01 from Birmingham:

Basic, Valley furnace.....	\$19.00 to \$19.50
N'th'n No. 2 fdy., sil. 1.75 to 2.25	21.00
Southern fdy., sil. 1.75 to 2.25..	\$25.01 to 26.51
Malleable	21.00
Ohio silvery, 8 per cent.....	31.52
Standard low phos., Valley fur- nace	27.50

Semi-finished Steel.—With increased operations by hot mills, specifications for sheet bars are heavy and the available supply in excess of contract obligations is no longer plentiful. One Valley district mill is committed for the remainder of the year. The market is well established at \$33.50, Youngstown, and on some immediate shipment business Pittsburgh mills have met Youngstown competition by naming a price of \$33.50, Youngstown, instead of Pittsburgh. On the other hand, a Cleveland mill reports the sale of 1000 tons of sheet bars at \$35, Pittsburgh.

Sheets.—Weak spots seem to have finally disappeared and the market is firmly established at 3.15c. for black, 2.30c. for blue annealed, and 4.30c. for galvanized sheets. While most of the mills are holding to the Pittsburgh basing point, sheets can still be bought at the above prices on a Youngstown base. Sales are not so heavy as they have been, as most consumers are under contract for their requirements for the next few weeks. Several mills catering to the automotive industry have specifications enough to keep their plants in full operation well into December. Some inquiries for sheets have come out for first quarter, but makers are not yet quoting for that delivery.

Strip Steel.—An advance of \$3 a ton to 4.90c., Cleveland, has been made on cold rolled strip steel. This follows the recent advance of \$2 a ton on hot rolled strip. The latter is holding firmly at the new prices. Mills are comfortably filled with orders for both hot and cold rolled material.

Bolts, Nuts and Rivets.—Demand for bolts and nuts continues very good. There is not much new business, as most consumers are under contract. Prices are very firm. Cap and set screw manufacturers have made a five per cent advance in prices. The leading local maker today advanced large rivets to \$2.60 per 100 lb.

Coke.—The heavy demand for domestic coke continues and prices have further advanced. Ohio by-product furnace coke has sold at \$9 and in egg size at \$9.50. Connellsburg foundry coke has sold as high as \$10. Painesville by-product foundry coke has been advanced \$1.50 to \$9 for November shipment and Ashland by-product foundry coke has been advanced 50c. to \$7 for the same delivery.

Old Material.—There is still some buying by mills but the market is not so active as a week or two ago when several round lots were purchased by Cleveland and Valley district mills. The market is very firm with slight advances on blast furnace scrap. A Valley district mill is reported to have bought heavy melting steel at \$19 during the week and the market is now quoted at \$18.50 to \$19 for Valley delivery. For Cleveland delivery dealers are paying \$17.75 to \$18, delivered, for heavy melting steel scrap. Not a great deal of scrap is coming out as producers and dealers are holding to their material for further advances. However, one local consumer has suspended shipments, as scrap was coming in faster than it could be handled.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$17.25 to \$17.75
Rails for rolling.....	16.75 to 17.00
Rails under 3 ft.....	19.50 to 20.00
Low phosphorus melting.....	19.00 to 19.25
Cast iron borings.....	14.25 to 14.50
Machine shop turnings.....	12.75 to 13.00
Mixed borings and short turnings	14.25 to 14.50
Compressed sheet steel.....	15.25 to 15.50
Railroad wrought.....	14.25 to 14.50
Railroad malleable.....	19.50 to 20.00
Light bundled sheet stampings.....	12.25 to 12.50
Steel axle turnings.....	15.25 to 15.50
No. 1 cast.....	18.00 to 18.50
No. 1 busheling.....	14.00 to 14.25
Drop forge flashings.....	13.50 to 14.00
Railroad grate bars.....	13.50 to 13.75
Stove plate.....	13.50 to 13.75
Pipes and flues.....	11.25 to 11.50

New York

Pig Iron Buying Active on Advances— Large Structural Steel Contracts

NEW YORK, Oct. 27.—Further advances in pig iron have stimulated buying, particularly for first quarter. Although many of the larger buyers have covered their needs for that delivery, sales in this district during the week aggregated fully 20,000 tons. Smaller melters are hastening to purchase their requirements, frequently using the telephone or telegraph to get their orders on the books of furnaces. As a consequence, there are fewer formal inquiries before the trade than one would expect in view of the volume of business which is being closed. The steady rise in coke continues to have its effect on pig iron. Eastern Pennsylvania producers are not quoting for first quarter and are taking business sparingly for early delivery on the basis of \$22, furnace, for No. 2 plain. Buffalo makers have made sales for the current quarter at \$20 to \$20.50, base furnace, and for first quarter are asking \$21. One effect of the disinclination of domestic furnaces to load their books for forward delivery has been a heavier sale of foreign iron. A round tonnage of Dutch foundry has been sold during the week on the basis of \$22, duty paid port of entry, for No. 1X and lower grades. German foundry continues to be offered at \$20 to \$20.50, base, duty paid on dock. Despite the uncertain coke situation it is planned to blow in the Port Henry furnace by Nov. 15. A New Jersey melter has placed 1500 tons of foundry for fourth quarter, and a local buyer has closed for 1000 tons of foundry for first quarter delivery to a plant in the Detroit district. The Thatcher Furnace Co., Newark, N. J., is in the market for its first quarter requirements in No. 2 plain and No. 2X, which will probably total 3000 to 4000 tons. The Crane Co. is inquiring for 1000 tons of foundry for its Bridgeport, Conn., plant. Another current inquiry calls for 5000 tons of foundry for first quarter. A New Jersey user wants 300 tons of No. 2 plain and No. 2X for the same delivery. Virginia iron is moving more freely in this territory; a recent sale of 500 tons of foundry for quick shipment was closed at \$24, base, furnace.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.54 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25..	\$24.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75 ..	25.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25 ..	25.52
Buffalo, sil. 1.75 to 2.25 (all rail)	24.91
Buffalo, sil. 1.75 to 2.25 (by barge canal del'd alongside in lighterage limits N. Y. and Brooklyn) ..	22.75
No. 2 Virginia, sil. 1.75 to 2.25..	29.54

Ferroalloys.—Total sales of ferromanganese for the week are estimated at 1000 to 1500 tons, one lot reported as 600 tons. There is very little new inquiry. Spiegeleisen prices have been advanced \$1 per ton, largely because of higher coke. The 20 per cent grade is now \$34, furnace, with the lower grade at \$33. The market is moderately active. Specifications on contract for 50 per cent ferrosilicon and standard ferrochromium continue heavy. Imports of manganese ore in September were about 45,000 gross tons, bringing the total for the first nine months of the year to about 344,800 tons. This compares with 409,200 tons for the same nine months last year.

Warehouse Business.—All grades of steel and the non-ferrous metal markets are showing a marked firmness with advances registered in some products. Black and galvanized sheets have been stepped up to a minimum of 4.15c. and 5.15c. per lb. base, as a result of the firmer attitude of the mills. In addition, jobbers' stocks of sheets are apparently not large and there is some evidence of transactions between warehouses to fill in on certain sizes. Shading of the 3.24c. per lb. base on structural steel has practically disappeared and although the volume of orders is about the same

as in previous weeks, tonnages are larger, ranging up to 10 and 15 tons to an order. The higher mill price on aluminum sheets has resulted in a slight advance in the warehouse price. Prices on page 1240. We quote boiler tubes per 100 ft. as follows:

Lap welded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

Finished Iron and Steel.—October has brought a substantial improvement in steel business, which is quite marked in sheets, bars and structural steel. Many of the sheet mills are now comfortably filled up for the remainder of the year and in some instances deliveries of four to eight weeks are being quoted. Sheet prices have strengthened considerably and 2.30c. for blue annealed, 3.15c. for black and 4.30c. for galvanized are said to be firm. One company has advanced its quotation on galvanized sheets to 4.50c., Pittsburgh. Steel bars are firm at 2c., Pittsburgh, with deliveries running from three to six weeks, depending on sizes. The remarkable thing about structural steel tonnage this month is that it has held up to the record of September and may exceed that total. Among the larger awards of the week are 20,000 tons for an office building in New York, which is to be the largest office building in the country, and 11,200 tons for New York subway work. A viaduct connecting with the New York-New Jersey vehicular tunnel on the New Jersey side calls for 4500 tons of steel. Railroad car buying has not been large during the week, but prospects are improving. The New York Central is in the market for 1000 steel gondolas. The Central of Georgia has ordered 1000 box cars from the Tennessee Coal, Iron & Railroad Co. The Eastern plate situation is of grave concern to plate makers, who individually do not seem to be able to check the decline in prices. It is pointed out that plates are selling in the East at \$6 to \$8 a ton below the prices obtainable in other districts. A Pittsburgh mill which has a fairly full plate schedule to the end of the year has obtained almost none of its business in the East. Although Eastern plate mills quote 1.70c., Pittsburgh, it is only the very small lots than can be sold at this price. Buyers for desirable lots find no difficulty in getting quotations of 1.60c. and 1.65c., Pittsburgh. A plate buyer with 1500 tons to place endeavored this week to find a mill willing to take the tonnage at 1.50c., Pittsburgh. The weakness in plates is in sharp contrast to the growing strength of other prices. Some of the spotty weakness in structural shapes is disappearing and buyers are less likely to get quotations below 1.90c., Pittsburgh.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c.; plates, 1.94c. to 2.14c.; structural shapes, 2.14c. to 2.24c.; bar iron, 2.14c. to 2.24c.

Cast Iron Pipe.—Purchasing of pressure pipe by gas companies continues a feature. The French seller is still an active factor and competition on current business is reported to be keen. A recent sizable booking by a domestic maker was a total of 3000 tons of 30 and 36-in. pipe for Baltimore, taken by the Warren Foundry & Pipe Co. John Fox & Co. took the order for 500 tons of pipe for Queens County, New York, placed by the contractor, the Stanny Construction Co. The entire tonnage of pipe and fittings, bids on which were opened Sept. 16 by New York, go to the low American bidders, the courts vacating an injunction to the contrary. The recipient of the orders for the six sections on which the German company was low is the Talladega Foundry & Machine Co. In a few days New York will ask for bids on another tonnage of similar size. Makers of soil pipe have reduced discounts slightly so that the range today is 4½ points lower. Jobbers are endeavoring to cover at the old discounts and in some instances business is apparently still being done at these prices.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$50.60 to \$51.60; 4-in. and 5-in., \$55.60 and \$56.60; 3-in., \$65.60 to \$66.60, with \$5 additional for Class A and gas pipe. Discounts of both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 45 to 50 per cent off list; heavy, 55 to 60 per cent off list.

Coke.—Foundries are beginning to press for deliveries on contracts and consumers not well covered for the next few months are apparently showing some anxiety. Foundry coke prices are nominal at \$9 to \$9.50 per ton with run of the oven bringing about \$8.50 and coke screened to domestic sizes quoted at \$9 to \$9.50. Importers are offering British and German coke, Scotch by-product, run of the oven being offered at \$8.50 to \$9 per ton, c.i.f. and coke of German origin at \$9.50 to \$10 per ton for coke screened to domestic sizes. Dealers who are buying domestic coke are not inclined to purchase the foreign product on the offered deliveries of 30 to 40 days. Domestic by-product coke continues unchanged in this district at \$10.41 per ton, delivered Newark or Jersey City, N. J.

Old Material.—Although there is a well defined undertone of strength in the eastern Pennsylvania market (a reflection of the upward movement of western Pennsylvania prices), brokers' offerings show advances only in a few instances. At the same time the tendency of buying prices is distinctly upward. No. 1 heavy melting steel is still being purchased at \$16 to \$17 per ton, delivered eastern Pennsylvania consumers, but there is slightly more purchasing at \$16.25 and \$16.50 per ton delivered than formerly. No. 1 railroad wrought is quotable at \$15 to \$15.50 per ton, buying price, New York, a Jersey City, N. J., user paying a price that justifies broker purchases at \$17.50 per ton, delivered, the freight rate being \$1.89 per ton. Railroad malleable is quoted by brokers at \$19 per ton delivered to a Bridgeport, Conn., user.

Buying prices per gross ton New York follow:	
Heavy melting steel (yard).....	\$11.50 to \$12.00
Heavy melting steel (railroad or equivalent)	13.00 to 13.50
Rails for rolling.....	14.25 to 14.75
Relaying rails, nominal.....	23.00 to 24.00
Steel car axles.....	21.50 to 22.00
Iron car axles.....	24.00 to 24.50
No. 1 railroad wrought.....	15.00 to 15.50
Forge fire.....	10.00 to 10.75
No. 1 yard wrought, long.....	14.00 to 14.50
Cast borings (steel mill).....	9.75 to 10.25
Cast borings (chemical).....	13.00 to 14.00
Machine shop turnings.....	10.00 to 10.50
Mixed borings and turnings.....	9.75 to 10.25
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	12.25 to 12.75
Stove plate.....	10.50 to 11.75
Locomotive grate bars.....	11.50 to 12.00
Malleable cast (railroad).....	16.00 to 16.50
Cast iron car wheels.....	14.00 to 14.50
No. 1 heavy breakable cast.....	13.00 to 14.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:	
No. 1 machinery cast.....	\$18.00 to \$18.50
No. 1 heavy cast (columns, building material, etc.), cupola size	16.50 to 17.00
No. 2 cast (radiators, cast bollars, etc.)	15.50 to 16.00

Spirited Bidding for Scrap at Detroit

DETROIT, Oct. 27.—November lettings by the largest producers of waste material in the district have brought out the most spirited bidding that has developed for some months. Prices generally have advanced 25c. per ton in the past week, with the new awards probably showing a higher basis. The tone of the market is decidedly strong.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel	\$15.00 to \$15.50
Borings and short turnings.....	11.75 to 12.25
Long turnings.....	10.25 to 10.75
No. 1 machinery cast.....	16.00 to 17.00
Automobile cast	23.00 to 24.00
Hydraulic compressed	13.50 to 14.00
Stove plate	13.50 to 14.50
No. 1 busheling.....	13.00 to 13.50
Sheet clippings	9.00 to 9.50
Flashings	12.50 to 13.00

Two new batteries of coke ovens, under construction for more than a year and representing an investment of approximately \$3,500,000, will be completed by the Gary Works of the United States Steel Corporation within 60 days. Each of the two batteries contains 70 coke ovens and will give the Gary Works a total of 12 batteries with 840 separate ovens.

Philadelphia

Coke Situation Causing Greater Uncertainty and Higher Pig Iron Prices

PHILADELPHIA, Oct. 27.—With furnace coke at \$8.50 to \$9 and difficult to buy at any price, with pig iron 50c. to \$1 higher and with a strong and advancing scrap market, new elements in the market situation of the past week or two are strongly accented this week. Pig iron producers, concerned over the coke situation, have practically withdrawn from the market for the remainder of this year and are not considering business for the first quarter, the prospect being that some furnaces may have to go out of blast unless there is a settlement of the anthracite strike by Jan. 1. Pig iron men today were recalling the acute coke situation of July and August, 1920, when coke was sold at \$18 to \$20, Connellsville, and pig iron in the East went to \$48 to \$50, furnace.

The demand for domestic heating coke has continued so strong in the past week that at least three of the large steel companies, one in the East and two at Pittsburgh, have sold by-product coke freely and yet the demand is so far from satisfied that brokers here had no difficulty today in getting \$10, ovens, for domestic coke. An interesting sidelight on the coke and pig iron situation is that merchant blast furnaces having their coke bought to the end of the year could make much more profit by reselling their coke than by using it in the production of pig iron.

Pig Iron.—Eastern Pennsylvania furnaces have virtually withdrawn from the market, leaving the field almost entirely to the importers of foreign iron. Two or three furnaces have made sales rather reluctantly to regular customers for early shipment, but the buyer who has no close furnace connection is having difficulty in getting domestic iron. Numerous instances were related today of melters who were told by furnace representatives that they had nothing to offer for this year and had not opened their books for first quarter. The asking price for No. 2 plain is \$22, furnace, with No. 2X 50c. additional. Predictions are freely made that a \$25 pig iron market is a certainty of the near future. Foreign iron prices have also been advanced. An importer of Dutch iron has sold all that is due to arrive this year at \$22, c.i.f. Philadelphia, duty paid, and Indian iron has been sold at \$22.50, Philadelphia, with the prospect that \$23 will be asked shortly. An Eastern steel company is making an effort to cover its first quarter basic requirements, but apparently without result so far. No sales of basic iron are reported, but in line with advances on other grades it probably would not be sold at less than \$22, delivered. Two or three large consumers of foundry iron in the East, being unable to obtain sufficient domestic iron to cover their inquiries, have bought fair-sized lots of foreign iron. Buffalo iron at \$21, furnace, has been sold for delivery in this district at \$25.41. Virginia iron is still being quoted at \$22.50 to \$23.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:

East Pa. No. 2 plain, 1.75 to 2.25 sht.	\$22.76 to \$23.13
East Pa. No. 2X, 2.25 to 2.75 sht.	23.26 to 23.63
East Pa. No. 1X.....	23.76 to 24.13
Virginia No. 2 plain, 1.75 to 2.25 sht.	27.67 to 28.67
Virginia No. 2X, 2.25 to 2.75 sht.	28.17 to 29.17
Basic delivery eastern Pa.....	22.00 to 22.50
Gray forge	22.00 to 22.50
Malleable	23.00 to 23.50
Standard low phos. (f.o.b. furnace)	22.00 to 24.00
Copper bearing low phos. (f.o.b. furnace)	22.50 to 23.50

Ferroalloys.—Sales of ferromanganese are confined to small lots for early shipment. The price remains unchanged for either foreign or domestic, namely \$115, seaboard or furnace.

Billets.—Except for a sale of 450 tons of forging billets to a locomotive company there have been no large sales of billets. The market is slightly firmer than two weeks ago, when a sale of rerolling billets

was made at \$33.50, Pittsburgh, but sizable lots can be bought at \$34.

Plates.—In a few instances Eastern plate mills have been asked to quote for first quarter, but as those mills which buy their pig iron do not know what their iron costs will be there is no disposition to sell for that delivery. In a case where a plate fabricator insisted upon protection, 2.10c., Pittsburgh, was named. The price situation for early shipment continues unchanged, 1.60c. and 1.65c., Pittsburgh, being quoted on desirable lots and 1.70c. and 1.80c. on small lots. Some mills are talking of a price advance, but nothing in that direction has developed yet, the main anxiety of mills being to get sufficient tonnage to continue the present operating schedules. The Cramp shipyard placed about 2000 tons of plates, shapes and bars with the Steel Corporation for a passenger steamer to be built for the Eastern Steamship Co.

Structural Steel.—The Sesqui-Centennial Exposition is inquiring through a contractor for 4500 tons of steel for a machinery building. Other buildings will soon be up for bids. The Phoenix Bridge Co. will furnish 2100 tons for vehicular tunnel work at New York. The price situation shows only slight signs of strengthening. Some sales are being made at 1.80c. and 1.85c., Pittsburgh, although the prevailing quotation on the bulk of current business is 1.90c., Pittsburgh.

Bars.—Orders for steel bars at 2c., Pittsburgh, are not plentiful, but specifications on contracts, most of which were made at 1.90c., are liberal and mills have good operating schedules. Deliveries now quoted range from three to five weeks, depending upon sizes. Bar iron remains at 2.12c. to 2.17c., Philadelphia.

Sheets.—Sheet prices have become quite firmly established at 2.30c. for blue annealed, 3.15c. for black and 4.30c. for galvanized, Pittsburgh basis. Most consumers are covered on contracts running through fourth quarter at lower prices; hence new tonnage is mostly in small lots.

Warehouse Business.—Weakness has again developed in warehouse prices, notwithstanding strengthening mill prices. There have been no formal changes, but concessions are occasionally given from the prices below, which are for local delivery:

Soft steel bars and small shapes, 3.20c.; iron bars (except bands), 3.20c.; round edge iron, 3.50c.; round edge steel, iron finished, $1\frac{1}{2}$ x $\frac{1}{2}$ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, $\frac{1}{4}$ in. and heavier, 2.80c. to 3c.; tank steel plates, $\frac{1}{8}$ in., 3c.; blue annealed steel sheets, No. 10 gage, 3.35c.; black sheets, No. 28 gage, 4.35c.; galvanized sheets, No. 28 gage, 5.45c.; square, twisted and deformed steel bars, 3c.; structural shapes, 2.75c. to 2.90c.; diamond pattern plates, $\frac{1}{4}$ in., 5.30c.; $\frac{1}{2}$ in., 5.50c.; spring steel, 5c.; rounds and hexagons, cold-rolled steel, 3.90c.; squares and flats, cold-rolled steel, 4.40c.; steel hoops, 4.25c. base; steel bands, No. 12 gage to $\frac{1}{8}$ in., inclusive, 3.90c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 6.50c.

Imports.—Pig iron receipts at this port last week were large, 7973 tons from England, 2022 tons from India and 100 tons from the Netherlands. Other imports follow: Iron ore from Sweden, 6987 tons; chrome ore from Portuguese Africa, 4000 tons; manganese ore from British West Africa, 5944 tons; structural steel from Luxemburg, 726 tons.

Old Material.—Although no pronounced upward movement of scrap prices has occurred, the market is strong and some minor advances have taken place, principally on low phosphorus material, turnings and bundled sheets for steel works use, and stove plate and grate bars. A large tonnage of low phosphorus scrap has been bought by a maker of acid steel at \$22.50, delivered. No. 1 forge fire has been sold at \$15.50, and bundled sheets and steel works turnings at \$14.50, with \$15 asked. At least two mills have tried to buy a tonnage of steel scrap and were quoted \$18 to \$18.50, although the range of the market the past two weeks has been \$17 to \$17.50. Greater strength in the market in the Pittsburgh district has created a new feeling of optimism among scrap brokers and dealers which

will surely be reflected in higher prices soon if consumers come into the market.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel.....	\$17.00 to \$17.50
Scrap rails	17.00 to 17.50
Steel rails for rolling.....	18.50 to 19.00
No. 1 low phos. heavy 0.04 and under	22.00 to 22.50
Couplers and knuckles.....	21.50 to 22.00
Rolled steel wheels.....	21.50 to 22.00
Cast iron car wheels.....	18.50 to 19.00
No. 1 railroad wrought.....	18.50 to 19.00
No. 1 yard wrought.....	17.00 to 17.50
No. 1 forge fire.....	14.50 to 15.50
Bundled sheets (for steel works).....	14.50 to 15.00
Mixed borings and turnings (for blast furnace use).....	13.50 to 14.00
Machine shop turnings (for steel works use)	14.50 to 15.00
Machine shop turnings (for rolling mill use).....	14.50 to 15.00
Heavy axle turnings (or equivalent)	15.00 to 15.50
Cast borings (for steel works and rolling mill).....	14.50
Cast borings (for chemical plant)	16.50 to 17.00
No. 1 cast.....	18.00 to 18.50
Heavy breakable cast (for steel plant)	17.00 to 17.50
Railroad grate bars.....	14.50 to 15.00
Stove plate (for steel plant use)	14.50 to 15.00
Wrought iron and soft steel pipes and tubes (new specifications)	16.50
Shafting	23.00 to 24.00
Steel axles	24.00 to 25.00

IMPORTERS ACTIVE

Exports Confined to Small Japanese Inquiries—
British and German Coke Offered

NEW YORK, Oct. 27.—Coke is apparently taking its place in importation with steel and pig iron. As a result of the rapidly climbing domestic coke market, importers have become active in offering both the British and German product. One importer in New York estimates that actual purchases of foreign coke up to the present total about 15,000 gross tons, made up in part of 3500 tons and about 2500 tons in two shipments of British and two cargoes of German coke of 3000 to 4000 tons each. An importer recently offering run of the oven Durham coke from the United Kingdom at \$8 to \$8.50 per ton, c.i.f., reports Durham ovens temporarily out of the market, and is now quoting Scotch by-product, run of the oven, at \$8.50 per ton, c.i.f. While Welch coke is available, the price is considerably higher than either Durham or Scotch. German coke screened to domestic sizes, is offered at \$9.50 to \$10 per ton, c.i.f. Atlantic port.

Despite the attractive prices quoted on the foreign product, purchasing is only in moderate volume, dealers here fearing that in 30 to 40 days the entire aspect of the situation may have changed. There is also some fear of deterioration of the coke as a result of the handling and rehandling in shipment. Nevertheless, buying is continuing and the eventual tonnage of foreign coke purchased is expected to be of fairly large size.

Japanese buying is confined to small lots, with few exceptions. An outstanding inquiry from Japan is from the Ogura Oil Co., in the market for 12,500 boxes of oil can tin plate. An inquiry for three miles of 91-lb. high T-rails is expected to go either to the Imperial Steel Works or to a European mill, possibly the Phoenix A. G. in Germany.

In this connection, it is perhaps noteworthy that in certain quarters it is expected that in the near future the Imperial Steel Works at Yawata will be in position to supply practically all Japanese rail requirements, both governmental, including the South Manchuria Railway and the Corean State Railways, and privately owned railroads, on 60 and 75-lb. sections. On sheets, present and future additions to the capacity of the Kawasaki Dockcard Co. are expected to reduce Japanese imports from the United States to about one-third of normal.

Prices of Finished Iron and Steel Products (Carload Lots)

Tank Plates

F.o.b. Pittsburgh mill, base, per lb..... 1.80c. to 1.90c.
F.o.b. Chicago, base, per lb..... 2.10c.

Structural Shapes

F.o.b. Pittsburgh mill, base, per lb..... 1.90c. to 2.00c.
F.o.b. Chicago, base, per lb..... 2.10c.

Iron and Steel Bars

Soft steel bars, f.o.b. Pgh mills, base, per lb..... 2.00c.
Soft steel bars, f.o.b. Chicago, base, per lb..... 2.10c.
Reinforcing steel bars, f.o.b. Pgh mills, per lb..... 2.00c.
Rail steel bars, f.o.b. Chicago, base, per lb..... 2.00c. to 2.10c.
Common iron bars, f.o.b. Chicago, base, per lb..... 1.90c. to 2.00c.
Refined iron bars, f.o.b. Pgh mills, base, per lb..... 3.00c.
Common iron bars, eastern Pa. mill, base, per lb..... 2.10c.

Hot-Rolled Flats (Hoops, Bands and Strips)

All gages, narrower than 6 in., base per lb., Pittsburgh..... 2.50c.
All gages, 6 in. and wider, base per lb., Pgh..... 2.30c.
All gages, 6 in. and narrower, Chicago..... 2.60c.
All gages, wider than 6 in., Chicago..... 2.50c.
Cotton ties, per 45 lb. bundle, f.o.b. Atlantic ports..... \$1.28
Cotton ties, per 45 lb. bundle, f.o.b. Gulf ports..... 1.25

Cold-Finished Steel

Screw stock and shafting, f.o.b. Pgh mills, base, per lb. 2.40c.
Screw stock and shafting, f.o.b. Chicago, base, per lb. 2.40c.
Screw stock, base, per lb., Cleveland..... 2.45c. to 2.55c.
Shafting, ground, f.o.b. mill, base, per lb..... *2.80c. to 3.00c.
Strips, f.o.b. Pgh mills, base, per lb..... 3.75c. to 3.90c.
Strips, f.o.b. Cleveland mills, base, per lb..... 3.90c.
Strips, delivered Chicago, base, per lb..... 4.05c.
Strips, f.o.b. Worcester mills, base, per lb..... 3.90c.

*According to size.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per kg..... \$2.65
Galvanized nails, 1-in. and longer, base plus..... 2.00
Galvanized nails, shorter than 1 in., base plus..... 2.25
Bright plain wire, base, No. 9 gage, per 100 lb..... 2.50
Annealed fence wire, base, per 100 lb..... 2.65
Spring wire, base, per 100 lb..... 3.50
Galvanized wire, No. 9, base, per 100 lb..... 3.10
Galvanized barbed, base, per 100 lb..... 3.35
Galvanized staples, base, per kg..... 3.35
Painted barbed wire, base, per 100 lb..... 3.10
Polished staples, base, per kg..... 3.10
Cement coated nails, base, per count keg..... 1.80
*Bale ties, carloads, to jobbers..... 75, 15 and 5 per cent off list
*Bale ties, carloads, to retailers..... 75, 10 and 6 per cent off list
Woven wire fence, base, per net ton to retailers..... \$65
Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant, and Duluth, Minn., mills \$2 a ton higher; Anderson, Ind., \$1 higher.

*F.o.b. Cleveland.

Sheets

Blue Annealed

(base) per lb.
Nos. 9 and 10, f.o.b. Pittsburgh..... 2.30c. to 2.40c.
Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills..... 2.40c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh..... 3.15c. to 3.25c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill..... 3.25c. to 3.30c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh..... 4.30c. to 4.40c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill..... 4.40c. to 4.50c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh..... 3.15c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill..... 3.25c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. Pittsburgh..... 4.40c.

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill..... 4.60c. to 4.75c.

Tin Plate

Standard cokes, per base box, f.o.b. Pittsburgh district mills..... \$5.50
Standard cokes, per base box f.o.b. Chicago district mills..... 5.60
Standard cokes, per base box f.o.b. Elwood, Ind..... 5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base.....	20-lb. coating I. C.	\$15.50
8-lb. coating I. C. 11.50	25-lb. coating, I. C.	17.00
15-lb. coating I. C. 14.35	30-lb. coating I. C.	18.35
	40-lb. coating I. C.	20.35

Rivets

Large, f.o.b. Pittsburgh, base, per 100 lb.....	\$2.60
Large, f.o.b. Cleveland, base, per 100 lb.....	\$2.60 to 2.70
Large, f.o.b. Chicago, base, per 100 lb.....	2.75
Small, f.o.b. Pittsburgh.....	70, 10 and 5 per cent off list
Small, Cleveland.....	70, 10 and 5 to 70, 10 and 10 off list
Small, Chicago.....	70, 10 and 10 per cent off list

Rails and Track Equipment

(F.o.b.)

Rails, standard, per gross ton.....	\$43.00
Rails, light, billet, base, per lb.....	1.65c. to 1.70c.
Rails, light, rail steel, base, per lb.....	1.50c. to 1.60c.
Spikes, $\frac{1}{2}$ in. and larger, base, per 100 lb.....	\$2.80 to \$3.00
Spikes, $\frac{1}{2}$ in. and smaller, base, per 100 lb.....	3.00 to 3.25
Spikes, boat and barge, base, per 100 lb.....	3.25
Track bolts, all sizes, base, per 100 lb.....	3.90 to 4.25
Tie plates, per 100 lb.....	2.35 to 2.40
Angle bars, base, per 100 lb.....	2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Inches	Steel Black	Galv.	Inches	Iron Black	Galv.
$\frac{1}{8}$	45	$19\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{8}$	+11	+39
$\frac{1}{4}$ to $\frac{3}{8}$	51	$25\frac{1}{2}$	$\frac{1}{2}$	22	2
$\frac{1}{2}$	56	$42\frac{1}{2}$	$\frac{3}{4}$	28	11
$\frac{3}{4}$	60	$48\frac{1}{2}$	1 to $1\frac{1}{2}$	30	13
1 to 3	62	$50\frac{1}{2}$			

Lap Weld

2	55	$43\frac{1}{2}$	2	23	7
$2\frac{1}{4}$ to 6	59	$47\frac{1}{2}$	$2\frac{1}{2}$	26	11
7 and 8	56	$43\frac{1}{2}$	3 to 6	28	13
9 and 10	54	$41\frac{1}{2}$	7 to 12	26	11
11 and 12	53	$40\frac{1}{2}$			

Butt Weld, extra strong, plain ends

$\frac{1}{8}$	41	$24\frac{1}{2}$	2 to 3	61	$50\frac{1}{4}$
$\frac{1}{4}$ to $\frac{3}{8}$	47	$30\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{8}$	+11	+54
$\frac{1}{2}$	53	$42\frac{1}{2}$	$\frac{1}{2}$	21	7
$\frac{3}{4}$	58	$47\frac{1}{2}$	$\frac{3}{4}$	28	12
1 to $1\frac{1}{2}$	60	$49\frac{1}{2}$	1 to $1\frac{1}{2}$	30	14

Lap Weld, extra strong, plain ends

2	53	$42\frac{1}{2}$	2	23	9
$2\frac{1}{2}$ to 4	57	$46\frac{1}{2}$	$2\frac{1}{2}$ to 4	29	15
$4\frac{1}{2}$ to 6	56	$45\frac{1}{2}$	$4\frac{1}{2}$ to 6	28	14
7 to 8	52	$39\frac{1}{2}$	7 to 8	21	7
9 and 10	45	$32\frac{1}{2}$	9 to 12	16	2
11 and 12	44	$31\frac{1}{2}$			

To the large jobbing trade the above discounts on steel pipe are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by $1\frac{1}{2}$ point, with supplementary discount of 5 per cent. On iron pipe, both black and galvanized, the preferentials to large jobbers are 1, 5 and $2\frac{1}{2}$ per cent beyond the above discount.

Note—The above discounts on steel pipe also apply at Lorain, Ohio. Chicago district mills have a base 2 points less. Chicago delivered base $2\frac{1}{2}$ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point having the lowest rate to destination.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel	Charcoal Iron
2 to $2\frac{1}{4}$ in.....	27
$2\frac{1}{2}$ to $2\frac{3}{4}$	37
3 in.	40
$3\frac{1}{4}$ to $3\frac{3}{4}$ in.....	42 $\frac{1}{2}$
4 to $13\frac{1}{2}$ in.....	46

Beyond the above discounts, 5 to 7 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
$1\frac{1}{4}$ to $1\frac{1}{2}$ in.....	52	$3\frac{1}{4}$ to $3\frac{1}{2}$ in.....	47
$1\frac{3}{4}$ in.	36	4 in.	50
2 to $2\frac{1}{4}$ in.....	31	$4\frac{1}{2}$, 5 and 6 in.....	45
$2\frac{1}{2}$ to $2\frac{3}{4}$ in.....	39		

Hot Rolled

2 and $2\frac{1}{4}$ in.....	34	$3\frac{1}{4}$ and $3\frac{1}{2}$ in.....	50
$2\frac{1}{2}$ and $2\frac{3}{4}$ in.....	42	4 in.	53
3 in.	48	$4\frac{1}{2}$, 5 and 6 in.....	48

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing (New List)

Carbon 0.10 to 0.30 base..... 50 to 55 per cent off list
Carbon 0.30 to 0.40 base..... 45 to 50 per cent off list

Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

Prices of Iron and Steel Products and Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 51.50 per cent iron.....	\$4.55
Old range non-Bessemer, 51½ per cent iron.....	4.40
Mesaba Bessemer, 51.50 per cent iron.....	4.40
Mesaba non-Bessemer, 51.50 per cent iron.....	4.25
High phosphorus iron, 51.50 per cent.....	4.15

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian Iron ore, Swedish, average 66 per cent iron Manganese ore, washed, 51 per cent manganese, from the Caucasus.....	9.50c. to 10c.
Manganese ore, Brazilian or Indian, nominal Tungsten ore, high grade, per unit, in 60 per cent concentrates.....	9.50c. to 12c.
Chrome ore, Indian basic, 48 per cent Cr ₂ O ₃ , crude, per ton, c.i.f. Atlantic seaboard.....	\$12.00 to \$13.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₂ , New York.....	\$22.50 to \$24.00
	65c. to 70c.

Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsburg prompt.....	\$8.50
Foundry coke, f.o.b. Connellsburg prompt.....	8.50
Mine run steam coal, f.o.b. W. Pa. mines.....	1.50 to 2.10
Mine run coking coal, f.o.b. W. Pa. mines.....	2.00 to 2.25
Mine run gas coal, f.o.b. W. Pa. mines.....	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines.....	1.25 to 1.35
Gas slack, f.o.b. W. Pa. mines.....	1.40 to 1.50

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$8.50
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid.....	115.00
Ferrosilicon, 50 per cent, delivered.....	82.50 to 85.00
Ferrosilicon, 75 per cent.....	145.00 to 147.50
Ferrotungsten, per lb. contained metal.....	1.15 to 1.20
Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr, per lb. contained Cr. delivered.....	11.50c.
Ferrovanadium, per lb. contained vanadium Ferrocobaltitanium, 15 to 18 per cent, per net ton.....	\$3.50 to \$4.00
	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....	\$32.00 to \$34.00
Spiegeleisen, domestic, 16 to 19 per cent.....	31.00 to 33.00
Ferrosilicon, Bessemer, 10 per cent, \$34; 11 per cent, \$36; 12 per cent, \$38; electric furnace ferrosilicon, 10 per cent, \$38 furnace; 11 per cent, \$38; 12 per cent, \$38; 14 to 16 per cent, \$45.	
Silvery iron, 6 per cent, \$26.50; 7 per cent, \$27.50; 8 per cent, \$28.50; 9 per cent, \$30; 10 per cent, \$32; 11 per cent, \$34; 12 per cent, \$36.	

Fluxes and Refractories

Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, gravel, per net ton, f.o.b. Illinois and Kentucky mines.....	\$16.00
No. 2 lump, per net ton.....	19.00
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton.....	16.00
Fluorspar, No. 1 ground bulk, 95 to 98 per cent calcium fluoride, not over 2½ per cent silica, per net ton, f.o.b. Illinois and Kentucky mines.....	32.50
Per 1000 f.o.b. works:	

Fire Clay	High Duty	Moderate Duty
Pennsylvania.....	\$43.00 to \$46.00	\$40.00 to \$43.00
Maryland.....	48.00 to 50.00	43.00 to 45.90
Ohio.....	43.00 to 46.00	40.00 to 43.00
Kentucky.....	43.00 to 45.00	40.00 to 43.00
Illinois.....	43.00 to 45.00	40.00 to 43.00
Missouri.....	40.00 to 43.00	35.00 to 38.00
Ground fire clay, per ton.....		6.50 to 7.50
Silica Brick:		
Pennsylvania.....		40.00
Chicago.....		49.00
Birmingham.....		54.00
Silica clay, per ton.....	8.00 to 9.00	
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....		65.00
Gran magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....		40.00
Chrome Brick:		
Standard size, per net ton.....		48.00

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

Machine bolts, small rolled threads.....	60 and 10 per cent off list
Machine bolts, all sizes, cut threads.....	50, 10 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads.....	50, 10 and 10 per cent off list
Carriage bolts, cut threads, all sizes, 50 and 10 per cent off list	
Eagle carriage bolts.....	65 and 10 per cent off list
Lag bolts.....	60, 10 and 10 per cent off list
Plow bolts, Nos. 3 and 7 heads.....	50 and 10 per cent off list
Other style heads.....	20 per cent extra

Machine bolts, c.p.c. and t. nuts, ¾ x 4 in.,

45, 10 and 5 per cent off list

Larger and longer sizes..... 45, 10 and 5 per cent off list

Hot-pressed nuts, blank and tapped, square..... 4c. off list

Hot-pressed nuts, blank or tapped, hexagons..... 4.40c. off list

c.p.c. and t. square or hex. nuts, blank or tapped, 4.10c. off list

Bolt ends with hot pressed nuts..... 50, 10 and 10 per cent off list

Bolt ends with cold pressed nuts..... 45, 10 and 5 per cent off list

Washers*..... 6.50c. to 6.25c. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent less than above for less than car lots. On hot pressed and cold punched nuts the discount is 25c. less per 100 lb. than quoted above for less than car lots.

(Quoted with freight allowed within zone limits.)

Semi-finished hex. nuts:

½ in. and smaller, U. S. S..... 80, 10 and 5 per cent off list

¾ in. and larger, U. S. S..... 75, 10 and 5 per cent off list

Small sizes, S. A. E..... 80, 10, 10 and 5 per cent off list

S. A. E., ¾ in. and larger..... 75, 10, 10 and 5 per cent off list

Stove bolts in packages..... 80, 10 and 5 per cent off list

Stove bolts in bulk..... 80, 10, 5 and 2½ per cent off list

Tire bolts..... 60 and 5 per cent off list

Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)

(To jobbers and consumers in large quantities)

S. A. E.	U. S. S.	Per 100 Net		Per 100 Net
		1/4-in.	1/2-in.	
8.00	.44	\$0.44	\$0.44	\$2.35
10.00	.515	.515	.515	3.60
12.00	.62	.66	.66	5.65
14.00	.79	.90	1 1/4-in.	8.90
16.00	1.01	1.05	1 1/4-in.	12.60
18.00	1.38	1.42	1 1/4-in.	18.35
20.00	1.70	1.73	1 1/2-in.	21.00

Larger sizes—Prices on application.

Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws..... 80, 10 and 5 to 80 and 10 per cent off list

Milled standard set screws, case hardened, 80 and 10 to 80 and 5 per cent off list

Milled headless set screws, cut thread, 80 and 10 to 80 per cent off list

Upset hex. head cap screws, U. S. S. Thread, 80, 10, 10 and 5 to 80, 10 and 10 per cent off list

Upset hex. cap screws, S. A. E. Thread, 80, 10 and 5 per cent off list

Upset set screws..... 80, 10 and 10 to 80, 10 and 25 per cent off list

Milled studs..... 75 to 70 and 5 per cent off list

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$33.50 to \$35.00
Forging billets, ordinary.....	40.00
Forging billets, guaranteed.....	45.00
Sheet bars.....	\$33.50 to 35.00
Slabs.....	33.50 to 35.00
*Wire rods, common soft, base, No. 5 to ¾-in.	45.00
Wire rods, common soft, coarser than ¾-in.	\$2.50 over base
Wire rods, screw stock.....	\$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40.....	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10.00 per ton over base
Wire rods, acid.....	15.00 per ton over base
Skelp, grooved, per lb.....	1.90c.
Skelp, sheared, per lb.....	1.90c.
Skelp, universal, per lb.....	1.90c.

*Chicago mill base is \$46. Cleveland mill base, \$45.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E.	Series	Numbers	Bars
		2100* (½% Nickel, 10 to 20 per cent Carbon)...	100 lb.
		2300 (3½% Nickel).....	\$4.60 to 4.65
		2500 (5% Nickel).....	5.80
		3100 (Nickel Chromium).....	3.60
		3200 (Nickel Chromium).....	5.20 to 5.30
		3300 (Nickel Chromium).....	7.30
		3400 (Nickel Chromium).....	6.60
		5100 (Chromium Steel).....	3.60 to 3.70
		5200* (Chromium Steel).....	7.50 to 8.25
		6100 (Chromium Vanadium bars).....	4.40
		6100 (Chromium Vanadium spring steel).....	3.85
		9250 (Silicon Manganese spring steel).....	3.30
		Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium).....	4.20 to 4.45
		Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium).....	4.50
		Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum).....	4.45
		Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum).....	3.60
		Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum).....	4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for coal drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

Oct.	Lake	Straits		Lead		Zinc	
		Electro	Tin	New	New	St.	St.
			(Spot)	York	York	Louis	York
21.....	14.62 1/2	14.25	62.75	9.60	9.25	8.70	8.35
22.....	14.62 1/2	14.25	63.62 1/2	9.60	9.25	8.85	8.50
23.....	14.75	14.37 1/2	64.00	9.60	9.25	8.90	8.55
24.....	14.75	14.37 1/2	...	9.60	9.25	8.92 1/2	8.57 1/2
26.....	14.75	14.37 1/2	63.12 1/2	9.60	9.25	8.95	8.60
27.....	14.75	14.50	63.25	9.60	9.25	8.95	8.60

*Refinery quotation; delivered price 1/4c. higher.

New York

NEW YORK, Oct. 27.

In all markets moderate activity is the prevailing condition. Copper is a little stronger and buying is fairly good. Tin has again advanced with consumers the principal buyers. Lead is firm, with good demand. Zinc has again gone to higher levels.

Copper.—Though quiet on the surface, there is substantial buying of copper almost every day. Yesterday at least 9000 net tons was up for negotiation, a large portion being sold before the end of the day. As high as 14.75c., delivered, in the Connecticut Valley, was realized at the close of business, with earlier sales at 14.62 1/2c. Today the market is a little quieter, with 14.75c., delivered, asked by all leading producers, and only a limited quantity available at 14.70c., delivered. The market the past week has been down and up again, varying with London's changes. Business on the whole is good with both consumers and producers and export demand is better than it was recently. Lake copper is quoted at 14.75c., delivered.

Tin.—The tin market continues to advance, with buying by consumers the interesting feature. The day of the largest business last week was Thursday, Oct. 22, when 500 tons was sold, most of it going to consumers. On other days of the calendar week the market was quiet, total sales amounting to about 300 tons. Most of the business done on Thursday was for October-November delivery at New York, indicating that in the previous buying movement consumers had covered most of their requirements through October. Yesterday the London market declined about £4 per ton on futures and American consumers became active and bought heavily, the total being estimated at 400 tons. This is taken to indicate that consumers are not well covered and will buy on all dips of the market. Today the market was very quiet, with spot Straits quoted at 63.25c., New York, due largely to higher London prices. Over there spot standard was quoted at £284 17s. 6d., future standard at £284 2s. 6d. and spot Straits at £294. The Singapore market was £289 7s. 6d. The high premium on spot standard is due to a reduction in stocks, considerable being shipped to the United States, and the premium on Straits tin is due to small stocks in warehouses. Arrivals thus far this month have been 5220 tons, with 5475 tons reported afloat.

Lead.—The market is a little more active and the metal is in good demand. Conditions generally are unchanged, with prices firm. The leading producer continues its contract price at 9.50c., New York. In the outside market the principal Western refiner is quoting 9.25c., St. Louis. We quote the market at 9.25c. to 9.35c., St. Louis, or 9.50c. to 9.60c., New York.

Zinc.—Prime Western zinc has continued to advance and has reached the highest prices of the year. Prompt metal is scarce and bringing 8.65c., St. Louis, or 9c., New York, these prices being nominal. For November delivery the market is 8.60c., St. Louis, or 8.95c., New York. Continued foreign demand, together with fair buying by domestic consumers, but more particularly the statistical position of the metal are the causes of the strong market.

Nickel.—Ingot nickel in wholesale lots is quoted at 34c., with shot nickel at 35c. The quotation for electrolytic nickel is unchanged at 38c. per lb.

Antimony.—The scarcity of Chinese metal for prompt and early delivery is unabated. Metal for spot delivery is quoted today at 19c. and higher, New York, duty paid. Metal for arrival in November-December is quoted at 18.12 1/2c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is still quoted at 27c. to 28c. per lb.

Old Metals.—Business continues fair. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible	14.25
Copper, heavy and wire	13.25
Copper, light and bottoms	11.50
Heavy machine composition	10.25
Brass, heavy	8.75
Brass, light	7.75
No. 1 red brass or composition turnings	9.75
No. 1 yellow rod brass turnings	9.50
Lead, heavy	8.50
Lead, tea	7.00
Zinc	5.75
Cast aluminum	21.50
Sheet aluminum	21.50

Chicago

OCT. 27.—Copper has firmed up somewhat in a more active market and tin and zinc have increased in price due to more insistent demand. The price of lead is unchanged and antimony has advanced because of firm demand and low stocks. Among the old metals, zinc and pewter have advanced in sympathy with the upward movement of the new metals. We quote in carload lots: Lake copper, 14.75c.; tin, 64.50c.; lead, 9.50c.; zinc, 8.70c.; in less than carload lots, antimony, 20.50c. On old metals we quote copper wire, crucible shapes and copper clips, 11.50c.; copper bottoms, 10c.; red brass, 9c.; yellow brass, 7.75c.; lead pipe, 8c.; zinc, 5.25c.; pewter, No. 1, 36c.; tin foil, 44c.; block tin, 52c.; all being dealers' buying prices for less than carload lots.

To Resume Hearings in Bethlehem Merger Case

WASHINGTON, Oct. 27.—Announcement was made today at the offices of the Federal Trade Commission that it will resume hearing in the Bethlehem Steel Co. merger case in Baltimore at 10 a. m., Wednesday, Nov. 4. It is expected the proceedings there will last from one to two weeks, after which the hearings likely will be transferred to Pittsburgh, where a like period perhaps will be consumed.

After that it is planned to hold the concluding hearings for the commission's side in Washington. Present indications are they will begin here about Dec. 1, though the date is altogether indefinite. Several weeks are expected to be required to complete the testimony in Washington. The Bethlehem company, after taking time to prepare its case, will then present its rebuttal, the time to be consumed not being indicated.

Increased Bar Capacity of Gulf States Steel Co.

The steel bar capacity of the Gulf States Steel Co. will shortly be increased from 120 tons per day to 300 tons. Recently the company purchased the bar mill at Butler, Pa., of the Forged Steel Wheel Co. (affiliated with the Standard Steel Car Co.). Dismantling for shipment is now in progress, while at the company's works at Alabama City, Ala., foundations are ready to receive the machinery. Few bars were ever rolled at Butler and the mill has long been idle. Steel making capacity is available, demand on the company's wire mills not being at the same high level as that on the bar mills, which have been at times unequal to the demand.

PERSONAL

George N. Jeppson, works manager of the Norton Co., Worcester, Mass., is in Europe, visiting the company's plants in France and Germany.

A. G. Hertzler, recently with the Bearings Co. of America, Lancaster, Pa., has become associated with the sales department of the Pacific Sheet Steel Corporation, South San Francisco.

Walter J. Kenney has been appointed foundry superintendent at the New Britain, Conn., plant of the North & Judd Mfg. Co., succeeding his father, the late Martin H. Kenney. He has been acting as assistant superintendent for the past few years. He is a graduate of the Rensselaer Polytechnic Institute. Elmore E. Morse has been appointed assistant superintendent to succeed Mr. Kenney.

Owen D. Young, General Electric Co., Schenectady, N. Y., has been appointed chairman of the American Committee of the International Chamber of Commerce, succeeding the late A. C. Bedford.

W. C. Rodd, formerly construction engineer of the Studebaker Corporation, has become associated with the Willys-Overland Co., Toledo, in a similar capacity.

E. J. Frost, president, National Machinery Co., Tiffin, Ohio, has gone to Europe on a business trip.

J. C. Ward, director Edgar Allen & Co., Ltd., Sheffield, England, sailed for home Oct. 24. He visited the Chicago, New York and Montreal offices of the Edgar Allen Steel Co., during his recent visit.

William Dallman is not an executive of the Dallman Machine & Mfg. Co., gear maker, Milwaukee, as reported in THE IRON AGE recently. W. H. Schmidt is president, E. W. Edwards, vice-president, G. C. Moerschel, treasurer, and P. O. Dallman is secretary of the company.

C. H. Harlan, formerly of the Pittsburgh office of McClintic-Marshall Co., has been appointed resident contracting manager for that company's Chicago district office.

G. M. Fritch, who recently resigned from the American Brass Co., to accept a position with the Dallas Brass & Copper Co., 820 Orleans Street, Chicago, Ill., as assistant to the president, has been elected a director of the latter company.

James B. Connolly, manager of purchases and supplies, Mesta Machine Co., Pittsburgh, will instruct a night class in purchasing at the Pittsburgh Y. M. C. A. A committee, composed of G. Walter Sanborn, United Engineering & Foundry Co., D. E. Ferguson, H. K. Porter Co., and Frank Walton, Union Supply Co., all of Pittsburgh, will act as an advisory committee and assist in the instruction of the class.

John H. Bode, vice-president in charge of operations, Mackintosh-Hemphill Co., Pittsburgh, has resigned that position to become president of the Wellman-Seaver-Morgan Co., Cleveland. Mr. Bode has been active in the rolling mill business for several years and before joining the Mackintosh-Hemphill Co. had been identified with the United Engineering & Foundry Co., Youngstown, Ohio, and the Mesta Machine Co., Pittsburgh. He is a graduate of Case School of Applied Science.

Wilbur R. Maher, formerly with Rogers, Brown & Co., has joined the sales force of E. Arthur Tutein, Inc., 52 Vanderbilt Avenue, New York, and will cover the eastern New York territory.

F. A. Shick, comptroller Bethlehem Steel Corporation, Bethlehem, Pa., has been elected a director of the corporation.

P. E. Seibel has joined the sales force of the Triplex Machine Tool Co., manufacturers' representative, 50 Church Street, New York.

J. R. Green has been placed in charge of the new branch of the Brown Instrument Co., Philadelphia, with offices at 215 East New York Street, Indianapolis.

G. S. Frazee has been appointed manager of the Cleveland, Ohio, branch of the Brown Instrument Co., with offices at room 1108 Hippodrome Building.

Eugene A. Johnson has been appointed assistant to the superintendent Pratt & Whitney Co., Hartford, Conn.

Raymond G. Bullock has taken up the duties of works manager of the Art Metal Construction Co., Jamestown, N. Y.

W. H. Foster, president General Fireproofing Co., Youngstown, has sailed for Europe to study market conditions there, especially with reference to the establishment of additional connections for the marketing of pressed steel products manufactured by the company.

Dr. Carl Pardun, chief engineer of the foundry department of the Gelsenkirchener Bergwerks A. G., Germany, is in the United States for a stay of several weeks.

Capt. Ralph Earle, U. S. N., was inaugurated president of the Worcester Polytechnic Institute, Worcester, Mass., Oct. 22, in the presence of a distinguished gathering of engineers, scientists and educators, including representatives of the Eastern universities, colleges and engineering schools, and of the national engineering societies. President Earle achieved fame in the World War, serving as chief of ordnance of the navy, with rank of rear admiral from 1916 until the Armistice. His service was conspicuous in connection with the plans for the North Sea barrage, the Navy railroad guns which were highly effective on the French front, and the depth bomb.

New Chairman of Trumbull Steel Co.

YOUNGSTOWN, Oct. 27.—C. S. Eaton, Cleveland, a partner in Otis & Co., investment brokers, is scheduled to become chairman of the board of directors of the Trumbull Steel Co. The president, whose appointment will be dictated by James A. Campbell, Youngstown Sheet & Tube Co., will be a practical operating man, and two high officials of the Youngstown independent are being mentioned in this connection. The Otis concern is taking an active part in the flotation of \$18,000,000 first mortgage bonds and debenture notes, which comprise the Trumbull company's current financial program.

A two-thirds vote of stockholders is necessary for approval of the financing and liberal responses are being received, following letters which were sent out last week. Upon the completion of the financing program it is the intention of Philip Wick, acting president, to retire. Mr. Wick assumed the presidency following the resignation of Jonathan Warner.

It is expected October will prove to be one of the best months in the history of the Trumbull company, from the standpoints of gross business and net earnings. Plant improvements which were halted in August are again being carried forward and it is the plan to add in 1926 an eighth open-hearth furnace, for which foundations have been laid, thus making the company self-contained in its raw steel requirements.

Russell Carter, in charge of sheet sales, has resigned from the Trumbull company. Prior to this connection he was advertising manager of the Brier Hill Steel Co., working in close cooperation with the sales department.

OBITUARY

HARRY KENNEDY, one of the most experienced blast furnace men of the country, died at Sheridan, Pa., Oct. 20. He was born in Washington County, Pa., in 1863, the son of Rev. David S. Kennedy, a United Presbyterian clergyman. His first connection in the iron and steel industry was with the Carnegie Steel Co., which advanced him to the position of blast furnace superintendent. He was next called to take charge of the Iroquois Furnace at Chicago for Rogers, Brown & Co., and later constructed and operated a furnace for the Nickopol-Mariopol Mining & Metallurgical Co. in Russia. Returning to the United States he again became identified with the Carnegie interests, taking charge of the Clairton furnaces. Still later he was blast furnace superintendent of the Donner Steel Co., Buffalo. Mr. Kennedy left the Donner Steel Co. to engage in the manufacture of ferromanganese for the Lavino Furnace Co., and this connection continued until within a short time of his death. Reid Kennedy, president of the Monongahela Trust Co., Judge A. G. Kennedy and Thomas Kennedy of DeKalb, Ill., are brothers of the deceased. Julian Kennedy of Pittsburgh is a cousin.



HARRY KENNEDY

LOUIS E. BRAYTON, for the past twelve years a general salesman in the Chicago office of Manning, Maxwell & Moore, Inc., died as the result of an acute heart attack at Salt Lake City, Utah, Oct. 22. He was born in Providence, R. I., and began his career in the machine tool trade with the Builders Iron Foundry of that city. He was formerly associated with the Jones & Lamson Machine Co., Springfield, Vt. Mr. Brayton was 53 years of age and is survived by a daughter and a son who live in Los Angeles, where the funeral will be held.

WALTER H. PERKINS, formerly vice-president of the J. B. Wise Co., founders and machinists, Watertown, N. Y., died at his home in that city, Oct. 18, following a five years' illness. He was born in Columbia, Conn., in 1870, and was at one time superintendent of the Waterbury Mfg. Co., Waterbury, Conn. In 1911 he accepted a position as superintendent for the Wise company, later becoming vice-president. He resigned this position in 1920 and was made president of the New Jersey Tube Co., Newark, but was forced to resign a year later on account of ill health.

BENJAMIN ATHA, a pioneer steel manufacturer of Newark, N. J., died in that city Oct. 24, aged 82 years. His father, Andrew Atha, came to this country from Yorkshire, England, in 1842, and settled at Liberty, N. Y., where Benjamin Atha was born. In 1848, the family removed to Newark and Andrew Atha began manufacturing crucible steel on Chapel Street under the name of Prentice, Atha & Co. Benjamin Atha entered the business in 1864. In 1871 the firm name was changed to Benjamin Atha & Co. Andrew Atha died in 1878. The business grew to large proportions and in June, 1891, the Benjamin Atha & Illingworth Co. was formed by the consolidation of Benjamin Atha & Co. and John Illingworth & Co. In 1900 the company's principal plant, originally known as the New Jersey Steel Works, was sold to the Crucible Steel Co.

of America, which now maintains it as its Harrison, N. J., works. Benjamin Atha and others, including his sons, Henry G. Atha and Herbert Atha, formed Benjamin Atha & Co. in 1900 and acquired the Newark plant of the Benjamin Atha & Illingworth Co. This was operated for some years as a steel foundry. Mr. Atha was the last of the original directorate of the Prudential Insurance Co., which celebrated its fiftieth anniversary this month. He is survived by his wife and four sons, Henry G. Atha, Albert A. Atha, Charles G. Atha and Louis M. Atha. Charles G. Atha is director of Stewart & Lloyds, Ltd., Glasgow, Scotland. John Illingworth, who was so long associated with Benjamin Atha, died in 1920.

ALBION B. PEAVEY, aged 64 years, vice-president and sales manager of the George F. Wright Steel & Wire Co., Worcester, Mass., died Oct. 22 following an operation. He was a native of Lubec, Me. Most of his life was spent traveling in the Middle West and South for the Reed & Prince Mfg. Co., the Wright Wire Co. and its successor, the Wickwire-Spencer Steel Co. When the George F. Wright Steel & Wire Co. was established in 1921 he was an incorporator and took charge of the sales end of the business.

JOHN I. BEGGS, president Milwaukee Electric Railway & Light Co., Milwaukee, died Oct. 17 following an operation. He was 78 years of age. He was the leading figure in many of the largest utility corporations in the Middle West, and also founded numerous large manufacturing enterprises, among them the Milwaukee Rolling Mills Co., now the Milwaukee division of the Inland Steel Co.

THOMAS A. COLEMAN, president Madison Kipp Co., Madison, Wis., manufacturer of lubricating devices for machine tools, automobiles and tractors, died Oct. 19 at the age of 67 years. He was born in Oshkosh, Wis., and early in life became a prominent figure in the farm machinery business. At the time of his death he was a vice-president of the International Harvester Co.

CHARLES KEELER WINSLOW, aged 64, a statistician for the United States Steel Corporation, died of heart disease at his home, Upper Montclair, N. J., Oct. 21. In 1891 he entered the service of the Illinois Steel Co. and ten years later went with the Steel Corporation. His brother, F. B. Winslow, is auditor of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

FRANK R. MCFEATTERS, general superintendent Union Railroad, Pittsburgh district interplant system of the United States Steel Corporation, died at his home in Wilkinsburg, Pa., Oct. 25. He was born in Brush Valley, Pa., 70 years ago, and had been with the Union Railroad since its organization in 1896, first as superintendent and for the past 10 years as general superintendent.

EDWARD S. PAGE, president Cleveland Wire Spring Co., Cleveland, died Oct. 27, aged 82 years. He was secretary of the Cleveland Rolling Mill Co. before it was taken over by the American Steel & Wire Co. With several associates he later organized the Cleveland Wire Spring Co., and was its vice-president many years, becoming its president about 10 years ago.

GEORGE M. BASFORD, consulting engineer of the Lima Locomotive Works, and long identified with the railroad field as a leader in railroad journalism, an inventor of locomotive appliances, and an affiliate of a number of railroad equipment companies at different times, died suddenly Oct. 26. Details are lacking at this writing. His headquarters were in the New York offices of the Lima company. He had been a member of the American Society of Mechanical Engineers since 1889 and served as a manager of the society for four years. He was a member of the Engineers' Club of New York.

Sykes Herringbone Gear Generator (Concluded from page 1191)

the cutter-operating mechanism. It has therefore been found advantageous to mount the headstock carrying the gear blanks rigidly, and to mount the cutter operating mechanism on a saddle. It has further been found desirable to provide eight speed changes and in addition a direct motor drive through a magnetic clutch.

Because of the large size of the machine, and the desirability of the greatest facility in operating and setting up, all control movements are made electrically. The saddle is moved to and fro by an independent electric motor; starting and stopping the machine is effected through the magnetic clutch; the feed changes, and the engagement and disengagement of the feed mechanism, is operated magnetically by means of solenoids. The pump for the cooler is also driven by a separate motor, and there is a fourth motor for turning the main work spindle so as to test the arbors for truth, and also the gear blanks after they are mounted. All these electric controls are operated by push buttons on a switch board placed in front of the machine. The machine illustrated in Fig. 5 is the No. 12, which is shown cutting a large herringbone gear. It is believed that the large machines installed at Buffalo have larger capacity than any other herringbone gear cutting machines in use.

Tooth Contours of Cutters Generated Inolute to Base Cylinder

The cutters used in the Sykes generating machines are made with the greatest precision; after they are hardened they are sharpened on the ends of the teeth only. The tooth contours are generated involute to a base cylinder, so that irrespective of the outside diameter which varies slightly, depending on whether a cutter is new or badly worn, it will always cut the same involute tooth shape. All the cutters are made with the base circle near the root of the teeth so that the whole cutting portion of the tooth contour is involute. The side relief on the teeth of the cutters is made in definite relation to the top relief, thus insuring that the thickness of the cutter teeth varies from front to back in correct proportion to the variation in diameter. This insures that the cutters will always cut exactly the same thickness of tooth in proportion to the depth. It is therefore claimed that the Sykes cutters will consistently generate exactly the same teeth both as regards thickness and tooth contour as well as exactly the same helix, whether they are worn or new.

It is generally known that the pinion type of cutter will generate gears having any number of teeth, from one tooth up to a rack, which represents an infinite number of teeth, therefore in the Sykes machines only one pair of cutters of any particular pitch is necessary to cut spur gears as well as helical or herringbone gears. To change the machine so that it will cut either kind of teeth the only alteration necessary is the substitution of straight guides for helical guides, and straight tooth cutters for helical cutters, or vice versa. These changes may be made conveniently and take but a few minutes on the smaller machines.

The smaller size cutters are made from solid high-speed steel forgings, the larger cutters being made with oil-toughened bodies with high-speed steel teeth which are secured to the bodies and can be changed when worn out or if accidentally broken. This construction is claimed to provide economical, durable and efficient cutters.

From the illustration of the cutter, Fig. 1, it will be seen that the sharpening of the faces of the cutting teeth is somewhat special. It is desirable, however, to explain that this sharpening may be easily done on any standard universal tool and cutter grinder.

The machines as already explained are made in four sizes, each of which has the following capacity: No. 1 $\frac{1}{2}$ cuts from $\frac{1}{4}$ in. up to 19 in. diameter, 8 in. face, 3 in. pitch; No. 2 from $\frac{1}{2}$ in. up to 30 in. in diameter, 12 in. face 2 D. P.; No. 4 from 1 in. up to 53 in. in diameter, 18 in. face 2 D. P.; No. 6 from 2 in. up to 72 in. diameter, 20 in. face 1 $\frac{1}{2}$ D. P.; No. 12 from 3 in. up to 18

ft. in diameter, 54 in. face 1 D. P. 4 in. pitch straight teeth.

Action of Helical Guides

The helical guides are often referred to as cams, whereas actually they are screws. In action they are pulled through or pushed through fixed nuts which are a counterpart of the screws except of much shorter length. The screws have a long lead and they impart to the cutters exactly the same lead. In the small machine illustrated the lead of the guides is 21.765 in., therefore if the cutter could make a stroke equal to this lead it would turn during one stroke exactly one revolution. It is a fundamental principle that if two helical gears are to mesh with their axes parallel, the lead of the helices will be in direct proportion to the number of teeth. For instance, if a pinion having 20 teeth and a lead of 30 in. is to mesh with a gear having 40 teeth, the lead of this gear must be 60 in. It will be understood after a little consideration that the diameter of the cutter has no influence on the helix angle of the gears cut. It is stated that irrespective of any question of diameter every gear cut on a Sykes helical machine will have a lead in direct proportion to the lead of the helical trace of the cutters, and to the number of teeth in the cutters, and the number of teeth cut. The diameter of the cutters does not influence the lead cut by the cutters.

There are three basic elements upon which all other considerations may be built. These are as follows: The number of teeth in each cutter, the base circle of the involute tooth curves, and the lead of the helical guides. The first two are fixed when the cutters are made, and the third when the guides are made.

It may be deduced from the above that it is possible with one pair of cutters to cut a variety of different pitches because the pitch of involute gears depends on the distance between the axes of any gear pair. The Sykes cutters themselves determine the base circle diameter which will be cut on any gear, but the base circle diameter does not determine the pitch circle diameter. Non-standard pitches may be cut by cutters which are nominally of standard pitch. It is stated it can be demonstrated mathematically that with a limited range of cutters any pitch may be generated on Sykes machines, that is to say any standard or non-standard pitch within the maximum and minimum of the range of the cutters.

British September Steel Exports and Imports Decline

WASHINGTON, Oct. 27.—Making a loss of 5 per cent., exports of iron and steel from Great Britain in September amounted to 273,237 gross tons, as against 287,789 tons in August, according to a cablegram received by the Department of Commerce from Commercial Attaché Mowatt M. Mitchell, London. The September export movement was lower than for any month since September of last year. Most of the decrease from August was attributed to a drop in foreign shipments of rails, wrought tubes, pipes and fittings.

During September the importation of iron and steel into Great Britain aggregated 190,046 tons, which is the smallest figure for any month since August, 1924. Receipts of foreign iron and steel were 232,849 tons in August, 1925. The falling off in imports was largely due to smaller receipts of pig iron, ferroalloys and semi-finished iron and steel.

Hickman, Williams & Co. to Sell Ferromanganese

The Electro Metallurgical Sales Corporation, 30 East Forty-second Street, New York, announces the appointment of Hickman, Williams & Co. as sales agents for its standard 78 to 82 per cent ferromanganese. Sales offices are maintained by the latter in Chicago, St. Louis, Cincinnati, Pittsburgh, New York, Philadelphia, Detroit and Cleveland. Distribution of this alloy will be made from stock on the Atlantic seaboard, New Orleans and the company's works.

Welding Applied to Manufacturing

(Concluded from page 1181)

steel fittings. In another case shown, the welded header would cost \$269 and the same header made up with lap joint piping and cast iron flanged fittings, would cost \$478. In the first case there was a saving in weight of 2980 lb., and in the second case a saving of 3530 lb. both in favor of the welded headers. This marked difference in cost was said probably to explain why there has been more rapid development in headers and allied work than in other pipe lines in power plant work, since the saving is largely proportional to the number of flanged fittings and joints. The advantages and savings in field work were also discussed.

The advantages of welding were said to be so important that the problem of removing the one single factor that limits their wide extension to the whole field of power plant piping becomes one of transcending importance. The single restricting factor, he said, is the development of some method to assure the absolute dependability of workmanship.

Proper materials, proper tools, proper methods and instruction and proper tests, the four factors upon which workmanship is based, were discussed. The methods employed must, it was said, be laid down by the engineering department and the welders instructed to follow them to the last detail. A copy of standard instructions to foremen for making a plain butt weld was shown, the same general practice being used with all welds, and forming the basis of the company's training of welders. Notwithstanding the adoption of an established method of welding, careful training in that method, and the development of a corps of men who do nothing but welding, it was said that experience indicated that some check on welders must be constantly employed to keep them up to the standard. The practice of Mr. Moulder's company is to take test pieces in the form of strips cut from the actual work at odd and unexpected times. These specimens are tested either by bending to a hairpin shape or by pulling. In addition to these tests of routine work, it has been found valuable, where some unusual piece of welding in the field is to be done, to give the selected welder special training in the shop duplicating, as far as possible, the actual field conditions.

The welding of the class of work encountered in "super-power" plants, where steam pressures range from 350 lb. up, with super-heat often raising the total temperature as high as 800 deg. Fahr. was taken up, Mr. Moulder saying, that in spite of these very high pressures and temperatures, he believed that any oxy-acetylene weld made in accordance with the methods and standards outlined in his paper, is a thoroughly practical type of joint for such service.

In conclusion, Mr. Moulder expressed the belief that the autogenous welding of piping is at the parting of the ways. "Either it is going forward very rapidly toward that ultimate goal its obvious advantages entitles it to reach, or it is going to be set back in its progress," he said. "Which way it goes depends upon what constructive means are taken to establish it on some standard basis of uniformity. Because such a standard must provide for the very doubtful human factor in the individual welder himself or at least for a high degree of responsibility on the part of his employer, the problem is complex."

Referring to the code on pressure piping suggested at the informal conference called by the standardization committee of the A. S. M. E. on May 19 at the A. S. M. E. spring meeting in Milwaukee, Mr. Moulder said, in conclusion:

"When the code on pressure piping becomes a reality, welding will go forward or sink below its present level in proportion to the way that the code treats welding. In order that welding may be favorably considered in the code, isn't it necessary that first of all the American Welding Society develop a rigid specification covering welding? Shouldn't that specification cover not only materials, welding procedure, test of finished work, but also set up a definite plan of action looking toward rigid licensing of those manufac-

turers whose shop and field methods and whose integrity and responsibility are such as to warrant their being publicly recognized to do such important work?"

Papers on Welding Rod and Wire

THE importance of the choice of suitable welding rod and an outline of the methods necessary in controlling the quality of such rod were dealt with in a paper on the "Control of Manufacture and Acceptance Tests of Welding Rods," by H. M. Carter, Oxfeld Acetylene Co., New York. At the same session a paper on "Welding Wire a Factor in Good Welding" was presented by C. A. McCune, director of research, American Chain Co., Inc., Bridgeport. The object of the paper was to draw attention to the fact that provisions are possible for a more rigid specification for the further protection of welding wire, as well as an appeal to the consumer to refrain from considering wire of the "market" type in preference to wire particularly processed for welding. The flame and electric current methods for testing welding wire were briefly described.

Another paper dealing with welding rods was that of J. R. Dawson, metallurgical engineer, Union Carbide & Carbon Research Laboratories, Inc., Long Island City, New York, under the title of "High Strength Welds." A brief description of what is known as the High Test welding rod, a comparatively new product for high strength welds was given, the properties of the new rod being illustrated by comparison with the so-called Norway iron and mild steel rods. Four advantages of the new rod were discussed, the advantages claimed being that the welds obtained are of superior physical properties; the rod is more "foolproof"; the metal is deposited at greater speed; and the weld obtained is less expensive.

C. J. Holstag, chief engineer, Electric Arc Cutting & Welding Co., Newark, N. J., contributed an interesting paper on the subject of "Metallic Arc Weldability of Ferrous Metals."

Research Important in Growth of Industry

THE importance of research in the development and growth of industry was convincingly set forth by Maurice Holland of the National Research Council, New York, in an address on the "Industrial Picture Viewed Through the Lens of Research," given at the meeting of the American Bureau of Welding. Dr. C. A. Adams, professor of engineering, Harvard Engineering School, Cambridge, presided, and in addition to addresses on subjects pertaining to research, reports were made by the various research committees of the bureau.

In an address on "Some Plans of the American Bureau of Welding," W. Spraragen, secretary of the bureau, said that a new investigation in the field of unfired pressure vessels was planned. Another investigation to be started in a year or two is in the structural field, in which it is thought there are extensive possibilities for the application of welding. This investigation will furnish additional data for engineers, designers and legislators. A broad general survey of the whole welding industry is also planned.

The gas welding committee, of which S. W. Miller, consulting engineer Union Carbide & Carbon Laboratories, Long Island City, N. Y., is chairman, is working on high temperature testing; methods of testing the skill of operators; weldability of metals—why some steels weld better than others; fatigue properties of gas welds; and manganese steel welding.

The arc welding committee, headed by H. M. Hobart, General Electric Co., Schenectady, has completed fatigue tests and will report results at the next meeting. Research into the arc welding of non-ferrous metals is also being continued.

The committee on welding wire specifications, of which C. A. McCune, director of research, American Chain Co., Bridgeport, is chairman, reported that the welding wire specifications adopted by the society are not complete, and that physical as well as chemical properties should be investigated. The committee is getting samples and making tests.

PIG IRON OUTPUT GAINS

Canadian Production of Steel Ingots Also Increases

TORONTO, ONT., Oct. 26.—Production of pig iron in Canada for the month of September amounted to 34,609 gross tons, or 31 per cent above the 26,513 tons produced in August, which in turn was 26 per cent above the output of July. There were sharp declines in the output of foundry and malleable grades, but this was more than offset by the increased production of basic iron for the further use of reporting firms. Basic iron output, at 25,579 tons, marked a three-fold gain over production in the preceding month; foundry iron output, at 9030 tons, was well under the 16,596 tons produced in August, while no malleable iron was produced in September, as against an output of 4609 tons in August. For the nine months ending with September the average monthly production of pig iron in the Dominion was 42,000 tons, which compares with 58,000 tons for the corresponding period a year ago.

During the month under review one additional furnace was blown in at Sydney, N. S., and one at Sault Ste. Marie, Ont., making a total of five active stacks as follows: British Empire Steel Corporation, Sydney, N. S., two; Algoma Steel Corporation, Sault Ste. Marie, Ont., two; and the Steel Co. of Canada, Ltd., Hamilton, Ont., one. The blowing in of the additional blast furnaces was a direct result of the placing of orders for steel rails by the Canadian Pacific and the Canadian National railroads.

Ferroalloy production, at 2046 tons, showed little change from the 2095 tons reported for the previous month, and was mostly of the grade having a high manganese content. Small quantities of ferrosilicon were also produced.

Output of steel ingots and castings advanced to 37,094 tons in September as compared with 25,007 tons in August. For the nine months ended with September the cumulative production of steel ingots and castings was 508,269 tons, as against 581,711 tons for the corresponding period of 1924. To date this year all of the ingots and seven per cent of the castings were made for the further use of reporting firms.

Opportunity to Exhibit Industrial Films in Germany

The United States Department of Commerce has been informed that the German official body "Ausschuss Fuer Wirtschaftliche Fortigung Reichskuratorium Fuer Wirtschaftlichkeit," which is similar to the United States Bureau of Standards, offers to exhibit photographs, motion picture films and printed matter at the Berlin Automobile Exhibition, which will be held Nov. 26 to Dec. 6. This exhibition will feature labor-saving devices, mass production methods, technical improvements, etc.

American machinery companies which have motion picture films that they would like to show at this exhibition may deliver those films to the exhibition through the American Commercial Attaché of Berlin, 21 Friedrich Ebertstrasse, Berlin, Germany.

Where Steel Exports Went in September

Canada Took 260,037 Tons of Nine Leading Items in Nine Months—Japan Third with 60,498 Tons, Following Cuba. 74,761 Tons—Argentina Took 47,504 Tons

Exports from United States, by Countries of Destination

(In Gross Tons)

	Steel Plates				Galvanized Sheets				Black Steel Sheets			
	Sept.		Nine Months Ended Sept.		Sept.		Nine Months Ended Sept.		Sept.		Nine Months Ended Sept.	
	1925	1924	1925	1924	1925	1924	1925	1924	1925	1924	1925	1924
Totals	6,160	6,305	75,556	68,289	12,875	8,140	122,571	75,069	12,069	11,395	65,793	110,960
Canada	4,401	4,943	57,904	52,822	1,951	1,328	19,880	14,220	3,902	2,350	32,745	26,643
Japan	37	5	916	230	307	730	2,936	10,960	6,733	8,331	23,587	73,988
Cuba	63	275	925	1,098	1,130	1,643	8,303	8,218	123	40	1,001	710
Philippine Islands	93	34	244	951	1,392	1,383	13,458	10,943	11	29	138	627
Mexico	142	51	1,021	534	903	387	5,676	4,048	...	188	...	188
Argentina	...	...	...	...	401	193	34,058	4,506	57	18	747	...
Chile	...	...	...	...	28	147	1,521	1,153	...	...	...	...
Colombia	...	...	...	...	460	357	1,323	2,656	...	...	...	...
Central America	...	...	...	...	...	459	...	3,555	...	...	...	...

Steel Exports Drop Back Again

50,000-Ton Gain in August Lost in September—
Imports Below Year's Average—Canada
Remains Best Customer

WASHINGTON, Oct. 26.—Amounting to 136,754 gross tons, exports of iron and steel in September were the lowest for any month since February, when they aggregated only 101,665 tons. The September movement, however, is only slightly under that of June, with a total of 136,847 tons, and July, with 138,670 tons. The drop in September exports under those of August (188,963 tons) amounted to 52,209 tons. The decrease in exports was reflected in most lines, although there were notable exceptions in the cases of galvanized and black steel sheets.

There also was a small general decline in most lines of imports, but by reason of comparatively large gains in scrap and one or two other items, the decrease was offset so that the August and September incoming movements were practically evenly balanced. Total

imports amounted to 68,445 tons, or only 44 tons less than in August.

The usual first position was taken by Canada as the leading country of export destinations in September, when 47,677 tons went to the Dominion. Cuba ranked second, taking 14,998 tons, while Japan was third, taking 13,091 tons. The United Kingdom took first place as source of imports in September, supplying 13,643 tons, of which 10,402 tons consisted of pig iron. Incidentally the United Kingdom was the leading source of pig iron imports in September, British India ranking second with 10,319 tons.

Casing and oil pipe to the amount of 9308 tons were exported in September, of which 4065 tons went to

Exports of Iron and Steel Products from the United States During September, 1925, by Countries

(In Gross Tons)

Belgium	858	Argentina	1,826
Denmark	152	Bolivia	143
Finland	69	Brazil	3,310
France	688	Chile	1,759
Germany	189	Colombia	7,041
Greece	16	Ecuador	102
Irish Free State	1	British Guiana	36
Italy	2,620	Dutch Guiana	54
Latvia	1	Paraguay	6
Malta, Goza	2	Peru	814
Netherlands	484	Uruguay	185
Norway	123	Venezuela	2,572
Portugal	3	<i>South America</i>	17,848
Rumania	140	British India	3,209
Russia in Europe	62	Straits Settlements	757
Spain	42	China	4,046
Sweden	21	Chosen	1
Switzerland	1	Java and Madura	1,623
Turkey in Europe	49	Other Dutch East Indies	2,365
United Kingdom	4,100	French Indo-China	2
<i>Europe</i>	9,621	Hong Kong	530
Canada	47,677	Japan	13,091
British Honduras	17	Kwan Tung	72
Costa Rica	198	Palestine and Syria	42
Guatemala	786	Philippine Islands	4,359
Honduras	141	Siam	10
Nicaragua	372	<i>Asia</i>	30,107
Panama	1,633	Australia	2,058
Salvador	1,058	British Oceania	14
Mexico	6,176	French Oceania	6
<i>North America</i>	58,058	New Zealand	28
Newfoundland and Labrador	119	British West Africa	1
Bermuda	26	British South Africa	1,431
Barbados	1	British East Africa	17
Jamaica	116	Egypt	100
Trinidad	269	Algeria and Tunis	20
Other Brit. W. Indies	526	Morocco	1
Cuba	14,998	<i>Portuguese East Africa</i>	101
Dominican Republic	907	Other Portuguese Africa	2
Dutch West Indies	189	Total	136,754
French West Indies	1		
Haiti	172		
Virgin Islands	17		
<i>American Islands</i>	17,541		

Imports of Iron and Steel Products Into the United States During September, 1925, by Countries

(In Gross Tons)

Austria	80	Virgin Islands	4
Belgium	11,768	Uruguay	1
Czechoslovakia	277	<i>America</i>	13,112
France	5,072	India	10,320
Germany	7,992	Ceylon	1
Irish Free State	19	Java and Madura	4
Italy	3	Hong Kong	2
Netherlands	3,893	Japan	3
Norway	43	Kwan Tung	125
Spain	1	<i>Asia</i>	10,455
Sweden	2,097	British West Africa	10
United Kingdom	13,643	Algeria and Tunis	30
<i>Europe</i>	44,838	Total	68,445
Canada	9,174		
Mexico	1		
Cuba	3,932		

Exports of Iron and Steel in Gross Tons

	All Iron and Steel	Pig Iron	Semi-Finished Material
*Average, 1912 to 1914	2,406,218	221,582	145,720
*Average, 1915 to 1918	5,295,333	438,462	1,468,020
*Average, 1919 to 1923	3,078,724	123,837	149,218
January, 1924	247,942	3,812	8,594
February	164,820	4,773	11,463
March	123,618	4,047	2,278
April	131,276	4,117	8,275
May	154,136	4,317	4,895
June	163,770	2,057	11,178
Fiscal year 1924	2,009,343	40,596	119,744
July	137,481	1,796	10,363
August	134,628	4,365	6,127
September	135,979	4,799	15,473
October	157,071	3,373	15,569
November	123,577	1,478	8,649
December	128,865	2,549	7,081
Calendar year 1924	1,792,421	41,478	114,417
January, 1925	140,802	1,298	5,764
February	101,665	1,413	7,516
March	154,178	2,037	7,951
April	154,426	1,632*	6,831
May	150,612	2,316	7,360
June	136,847	2,507	7,804
Fiscal year 1925	1,647,024	29,563	107,988
July	138,670	2,348	10,701
August	188,963	5,944	8,024
September	136,754	3,349	8,186
Nine months	1,306,674	22,844	71,140

*Calendar years.

Imports of Iron and Steel in Gross Tons

(By Months and Monthly Averages)

	Total Imports	Pig Iron	Ferro-alloys	Ore and Oxide*
January, 1924	26,675	10,587	3,033	23,081
February	42,269	15,482	4,847	4,430
March	39,278	16,919	3,941	46,067
April	50,969	17,171	7,371	29,729
May	66,801	25,220	5,501	31,993
June	60,569	28,697	2,347	24,726
July	30,410	13,511	1,435	12,287
August	44,928	16,189	1,120	16,160
September	45,214	16,347	3,578	6,269
October	40,873	10,963	8,608	12,088
November	35,707	9,880	7,596	19,919
December	69,281	28,143	10,530	28,305
Twelve months' average	46,370	17,426	4,992	21,672
January, 1925	77,058	41,344	7,165	15,498
February	92,373	47,803	10,997	9,666
March	92,106	50,803	5,691	24,330
April	71,249	33,299	7,699	14,941
May	68,117	21,260	8,721	29,139
June	82,330	35,657	4,259	20,720
Twelve months' average	62,449	27,099	6,440	15,578
July	64,642	24,881	3,601	28,586
August	68,489	30,707	3,526	34,168
September	68,445	29,917	3,594	22,709
Nine months' average	76,150	35,075	6,140	19,165

*Not included in "total imports." These figures are for manganese contents of the ore.

Colombia, 1,479 tons to the Dutch East Indies and 1,187 tons to Venezuela. Black welded pipe exports were 4,535 tons, of which 725 tons went to the United Kingdom, 572 tons to Mexico, 382 tons to Cuba, 381 tons each to Canada and Colombia and 331 tons to Venezuela. Exports of galvanized welded pipe totaled 3,433 tons, of which 527 tons went to Java and Madura, 367 tons to Colombia, 241 tons to Brazil and 248 tons to Venezuela.

Of ferromanganese imports, amounting to 3,294 tons, 2,294 tons came from the United Kingdom and 799 tons from Canada. Belgium provided 2,888 tons of the 3,748 tons of steel bars imported, while 137 tons came from France. Of the 6,086 tons of structural shapes imported, 4,983 tons came from Belgium, 349 tons from Germany and 344 tons from France. Of the 4,453 tons of rails imported, 2,481 tons came from Belgium and 209 tons from Germany. France supplied 3,829 tons of the tubes imported in September, out of the total of 6,260 tons, while 1,324 tons came from Germany and 527 tons from Belgium. Of the 22,709 tons of manganese ore imported in September, 9,989 tons came from British India, 6,648 tons from Russia and 5,628 tons from Brazil.

Rolled and finished steel exported in September

Sources of American Imports of Iron Ore

(In Gross Tons)

	September		Nine Months Ended September	
	1925	1924	1925	1924
Chile	30,300	39,300	693,500	761,445
Cuba	23,500	13,396	377,130	221,186
Spain	14,161	130,125	46,856	
Sweden	14,458	76,274	100,165	229,894
Algeria and Tunis	22,750	36,100	147,495	150,682
Canada	565	705	5,688	2,777
Other countries	1,120	1,284	45,825	28,231
Total	92,693	181,220	1,499,928	1,441,071

Exports of Iron and Steel from the United States

(In Gross Tons)

	September		Nine Months Ended September	
	1925	1924	1925	1924
Pig iron	3,349	4,799	22,844	34,083
Ferromanganese	21	108	4,101	3,253
Ferrosilicon				726
Scrap	4,940	2,668	62,185	87,205
Pig iron, ferroalloys and scrap	8,310	7,575	89,130	125,267
Ingots, blooms, billets, sheet bar, skelp, etc.	7,610	14,592	54,950	68,689
Wire rods	576	881	16,190	14,426
Semi-finished steel	8,186	15,473	71,140	83,115
Steel bars	8,790	6,139	82,386	78,651
Alloy steel bars	146	100	2,853	1,943
Iron bars	343	259	3,877	4,244
Plates, iron and steel	6,160	6,305	75,556	68,289
Sheets, galvanized	12,875	8,140	122,571	75,069
Sheets, black steel	12,007	11,395	65,794	110,960
Sheets, black iron	841	681	10,175	7,972
Hoops, bands, strip steel	3,812	1,945	29,676	26,542
Tin plate, terne plate, etc.	12,245	7,734	113,344	120,542
Structural shapes, plain material	7,591	9,098	68,656	87,741
Structural material, fabricated	5,822	6,228	50,882	54,072
Steel rails	9,611	18,713	130,833	157,935
Rail fastenings, switches, frogs, etc.	2,982	3,045	29,556	28,720
Boiler tubes, welded pipe and fittings	19,211	15,749	186,875	169,860
Plain wire	2,290	2,027	27,365	31,166
Barbed wire and woven wire fencing	4,872	6,563	53,207	66,820
Wire cloth and screening	104	88	1,327	1,368
Wire rope	226	340	3,386	3,462
Wire nails	777	527	6,737	19,004
All other nails and tacks	681	478	6,856	5,489
Horseshoes	41	88	542	760
Bolts, nuts, rivets and washers, except track	1,236	1,471	13,044	13,292
Rolled and finished steel	112,663	107,113	1,085,498	1,153,901
Cast iron pipe and fittings	3,473	1,978	22,866	20,638
Car wheels and axles	1,023	2,710	15,252	16,559
Iron castings	1,553	826	8,094	6,696
Steel castings	239	355	3,537	4,679
Forgings	126	57	1,738	1,179
Castings and forgings	6,514	5,926	51,487	49,751
All other	1,181	....	9,419	....
Total	136,754	136,087	1,306,674	1,392,051

Imports of Iron and Steel into the United States

(In Gross Tons)

	September		Nine Months Ended September	
	1925	1924	1925	1924
Pig iron	29,917	16,347	315,671	160,123
Ferromanganese	\$3,294	3,486	51,193	24,896
Ferrosilicon	300	92	4,064	8,280
Scrap	10,413	7,567	71,430	45,287
Pig iron, ferroalloys and scrap	43,924	27,492	442,558	238,586
Steel ingots, blooms, billets, slabs and steel bars	1,855	2,770	21,227	29,946
Wire rods	324	236	5,485	5,373
Semi-finished steel	2,179	3,006	26,712	35,319
Rails and splice bars	4,453	1,709	34,811	33,884
Structural shapes	6,086	3,201	61,284	29,441
Boiler and other plates	52	502	410	3,247
Sheets and saw plates	197	122	2,785	1,987
Steel bars	3,748	...	43,119	...
Bar iron	353	217	9,070	3,326
Tubular products	6,260	4,169	54,527*	43,761
Nails and screws	26	88	1,153	376
Tin plate	24	17	235	932
Bolts, nuts, rivets and washers	6	26	79	133
Round iron and steel wire	390	254	3,023	2,817
Flat wire and strip steel	170	256	1,610	1,742
Wire rope and insulated wire, all kinds	112	3,903	1,715	13,153
Rolled and finished steel	21,877	14,464	213,831	134,799
Castings and forgings	465	252	2,452	2,142
Total	68,445	45,214	685,353	410,846
Manganese ore	\$12,709	6,269	172,488	204,628
Iron ore	92,693	181,220	1,499,928	1,441,071
Magnesite	4,074	9,175	73,365	56,702

*Manganese content only.

An error occurred in the Government figures in June, a shortage of 515 tons, which has been added to above.

+Steel bars have been separated from semi-finished products, in the Customs reports, only since Jan. 1, 1925.

†This includes some cast iron pipe, under the heading "tubular products."

United States Imports of Pig Iron, by Countries, for September, 1925

(In Gross Tons)

	United Kingdom	British India	Summary:	
			Europe	America
	10,402	10,319	19,303	
	5,351	3,450	10,444	170
	170	125	Total	29,917
	100	100		
Total	29,917			

amounted to 112,663 tons, compared with 156,874 tons in August, 116,687 tons in July and 107,113 tons in the previous September. Rolled and finished steel imports in September were 21,877 tons, compared with 26,101 tons in August, 30,897 tons in July and only 14,464 tons in the previous September.

Artificial Basis of Luxemburg Activity

LUXEMBURG, Oct. 6.—The persistency of the strike at engineers' shops in Belgium has bereft the Luxemburg iron and steel trade of an important outlet. This deficiency of orders could be made up only by sacrifices in export prices.

For the time being, the Luxemburg ironworks have enough orders in hand, but this is due to the continued strike at some of the Belgian ironworks. When this strike has terminated it will be necessary to restrict Luxemburg production. From this will follow an immediate increase of costs and, probably, the laying off of a certain number of workmen.

Prices quoted, f.o.b. Antwerp, with American equivalents, follow:

Foundry pig iron (Belgian francs) 330 to 335 or \$14.65 to \$14.87 per gross ton	
Semi-finished steel (basic):	
Blooms	\$4 ss. or \$21.30
Billets	4 11 or 22.02
Largets (Slabs)	4 14 or 22.75
Wire rods	5 15 or 27.83
Beams	f5 1s to f5 3s. or 1.09c to 1.11c per lb.
Bars	5 6 or 1.15c
Heavy sheets, 5 mm. (No. 6 1/2 gage) and over	6 4 or 1.34c

GERMAN STEEL OUTPUT

Publication of Monthly Data on Pig Iron and Steel Resumed

A resumption of the publication of monthly statistics of the output of pig iron and steel for Germany is announced in the Oct. 8 issue of *Stahl und Eisen*, and the production for each month of 1924 and the first eight months of 1925 are given in detail. Sometime during the latter part of the war the giving of these monthly statistics was discontinued. For a few years after the war nothing was known officially of the output of pig iron and steel in Germany until, within the last year, totals for some of the years since the war were made public and published in THE IRON AGE.

The monthly figures for 1925 of both pig iron and steel as just made available, together with the total for 1924, are given in the subjoined table in metric tons. There is also included for comparison the data previously published for 1918 to 1923 and for 1913.

	Pig Iron	Steel
January, 1925	909,849	1,180,908
February	873,319	1,155,351
March	990,606	1,209,294
April	896,362	1,064,420
May	960,541	1,114,746
June	941,201	1,108,748
Half year, 1925	5,571,878	6,833,467
July	885,880	1,030,983
August	765,901	899,421
Eight months	7,223,659	8,763,871
1924, whole year	7,812,231	9,835,255
1923	4,936,340	6,305,250
1922	9,395,670	11,714,302
1921	7,845,346	9,996,538
1920	7,043,617	9,277,882
1919	6,283,873	7,847,356
1918	11,863,522	14,979,505
1913	19,309,172	18,935,089

Of the total steel output to Sept. 1, 1925, 223,560 tons was steel castings and of the total steel output for 1924, 230,280 tons was made in steel foundries.

American Machine Tools Regarded Highly in England

Competent members of the machine tool trade in Great Britain estimate that not less than 10 per cent of the machine tool equipment in British plants is of American manufacture, says Assistant Trade Commissioner W. M. Park, London, in a report to the Department of Commerce. In some lines of production, as for example the automobile and electrical goods industries, the percentage would range much higher—up to 25 or 30 per cent—but the average for all plants would not be lower than the 10 per cent figure. Says the report:

"This is particularly interesting and significant when it is remembered that the manufacture of machine-tools is an old and well established domestic British industry, and that American, or other foreign products of a similar nature, must compete with a highly developed home trade that is carefully organized throughout the British Isles. Considering that Germany and some other countries, notably France and Holland, also do an important machine-tool trade with Great Britain, and that until the past year the exchange feature has been in favor of German trade and against American participation, the percentage of American equipment now in use may be regarded as extremely high and very satisfactory."

"During the past four years American participation in the British machine-tool trade has also had to face an unprecedented depression in the British engineering industries, which, of course, are the principal purchasers of machine-tool equipment. Yet, the fact that American participation has not only been maintained, but has shown steady progress, as is evidenced by the fact that imports of American machine tools increased from £239,269 in 1922 to £278,585 in 1923 and to £341,688 in 1924. Sales of German machine tools made a perceptible advance in 1923, rising from £131,116 in 1922 to £157,002, but showed a considerable falling off

in 1924, dropping to £139,824. Imports of machine tools from all other countries totaled £53,019 in 1922, £64,035 in 1923 and £71,916 in 1924.

"During the eight months, January to August, 1925, inclusive, British machine-tool imports totaled £476,379, compared with £383,985 for the same period in 1924 and £314,086 during the first eight months of 1923. The United Kingdom was again the best customer for United States exports of metalworking machinery for the first six months of 1925, taking a total value of \$2,036,938 as against \$1,560,250 for the same period in 1924. Details of imports by other countries of origin for the present year are not yet available, but the increase on total imports bears out the opinion of the trade early in the year that 1925 would continue to show the steady improvement in demand that 1924 showed over 1923. Undoubtedly the present year's increase is mainly attributable to increased sales of American machine-tool equipment, as, since the stabilization of the German mark, and the partial elimination of the price advantage gained by Germany through a depreciated exchange, imports from that country have steadily declined.

"A careful inquiry as to what types of American machine tools meet with most success in the British market shows that special grinding machines, gear cutting machines, multiple drills, special machines for crankshafts and multi-cut lathes are now enjoying the best sales. The bulk of sales in American metal-working machinery parts is made in chucks, drills, taps, reamers and dies. These latter are sold not only for use on American machines, but, in many instances, because of their superior accuracy, are employed on machines of British, German or French origin used in British plants."

Russian Manganese Ore Exports to Be Increased

WASHINGTON, Oct. 27.—The Harriman Co. is undertaking extensive mechanization work at the Black Sea port of Poti, in preparation for increasing the exports of manganese ore from Chiaturi to 2,000,000 tons annually, according to a bulletin received by the Russian Information Bureau here. The port facilities are being improved to provide for the loading of 18 steamships simultaneously.

During the nine months before the Chiaturi manganese mines in the Georgian Soviet Republic were turned over to the Harriman concessionary in July, 325,800 tons of manganese ore was shipped from the fields, of which 54 per cent was shipped to the United States, according to reports received by the Russian Information Bureau. England took 15 per cent of the shipments, Holland 14 per cent, Germany 4 per cent, France 3 per cent, and 10 per cent was used for home consumption. Production during the period showed an increase of 26 per cent over the same period of the previous year. During the summer exports of manganese ore from the Krivoi Rog mines averaged 15,000 tons per month, chiefly to Germany and Italy.

At the time the Chiaturi mines were taken over by the Harriman company the manganese board of the Supreme Economic Council of Georgia was operating 12 mines and three plants for washing the ore. There were also 19 small private firms operating in the fields.

Manufacturing census figures covering 1923, which have just been released by the Bureau of the Census, include "Smelting and Refining of Non-Ferrous Metals" and "Brass, Bronze and Other Non-Ferrous Alloys and Manufactures of These Alloys and of Copper." The printed digest of either of these may be obtained at 5c. from the Superintendent of Documents, Government Printing Office, Washington.

The Fourth National Exposition of Power and Mechanical Engineering, to open at 2 p. m. on Monday, Nov. 30, at the Grand Central Palace, New York, will extend through the week, ending Dec. 5.

Machinery Markets and News of the Works

AUTOMOBILE MAKERS BUY

Several Companies Have Made Machine Tool Purchases

Business Is Improving in All Sections of the Country and Tool Plants Are Busier

AUTOMOBILE manufacturers were liberal purchasers of machine tool equipment in the past week. The Packard Motor Car Co., the Chrysler Motor Corporation, the Willys-Overland Co., Buick and other automobile companies have bought fair-sized lots of machines. The Willys-Morrow Mfg. Co., Elmira, N. Y., has revived a project for the replacement of its old equipment with new tools, and according to present plans nearly 400 tools may be bought, of which about half will be automatic screw machines. The Eaton Axle & Spring Co., Cleveland, continues the extensive purchases which were under way a week or so ago. Another large purchaser is the Nash Motors Co., Racine

and Kenosha, Wis., which is still in the market for about \$100,000 worth of tools, principally crankshaft lathes and grinding machines.

Orders from scattered industrial sources are more plentiful. The Youngstown Sheet & Tube Co. is understood to have closed at Youngstown for a list of tools for its Indiana Harbor, Ind., works. The Chicago Board of Education, after long delay, has closed for a list of about 20 machines for training schools. The A. O. Smith Corporation, Milwaukee, is still considering a fair amount of special production machinery. The Brooklyn-Manhattan Transit Co. is closing on a list of 8 or 10 tools that has been pending for some time. The Donner Steel Co., Buffalo, has bought a small list of tools. The Lorain Steel Co., Lorain, Ohio, and the Cambria works of the Bethlehem Steel Co., Johnstown, Pa., are in the market for frog and switch planers.

Most of the machine tool plants are getting busier and are hiring more men. One Cincinnati company reports having orders aggregating \$600,000 on its books. A shortage of skilled mechanics still presents a problem in some sections.

New York

NEW YORK, Oct. 27.

THE trend of machine tool business is toward continued improvement. Orders in the past week have borne out the good record of the preceding weeks of this month. The Donner Steel Co., Buffalo, bought a number of tools, including a 36 x 36-in. x 12-ft. planer and a 36-in. x 14-ft. lathe. The Ludlow Valve Co., Troy, N. Y., bought a 30-in. x 20-ft. lathe. The Florida East Coast Railroad purchased a 96-in., 600-ton wheel press from the Niles-Bement-Pond Co. and the Texas & Pacific bought a 5-ft. radial drill from the same company. The Brown & Sharpe Mfg. Co., Providence, R. I., has bought a number of Pratt & Whitney machines. The Brooklyn-Manhattan Transit Co. is placing orders for about 8 or 10 tools, the inquiry having been pending for some time.

Walcraft Products, Inc., Mountain Lakes, N. J., has been organized to manufacture duplicating machines. The company will acquire a building which was erected about three years ago and new equipment will be purchased. Walcraft Products, Inc., has been a selling organization and this will be its first effort in manufacturing its own products. In addition to machinery, the company will be in the market for tubing, castings, sheet steel and screws.

The Insulating Co. of America was recently organized with capital of \$250,000 for the purpose of taking over the Radio Panel & Parts Corporation, 59 Warren Street, New York, manufacturer of radio and electrical insulating materials. No change in the plant or personnel is contemplated at present.

The Atlantic, Gulf & Pacific Co., 51 West Sixty-sixth Street, New York, is taking bids on a general contract for a new oil storage and distributing plant, 60 x 140 ft. and 30 x 157 ft., at 1352 South Mill Avenue, Brooklyn, to cost \$100,000 with equipment.

C. P. Cannella, 1163 Herkimer Street, Brooklyn, architect, has completed plans for a two-story automobile service, repair and garage building, 95 x 100 ft., to cost \$60,000 with equipment.

The Rubel Coal & Ice Corporation, 197 Glenmore Avenue, Brooklyn, will build a one-story ice-manufacturing plant, 75 x 125 ft., at 2042-54 Gravesend Avenue, to cost \$80,000, and a one-story plant on Clermont Avenue, 50 x 100

ft., to cost \$70,000. E. M. Adelsohn, 350 Stone Avenue, is architect.

Murray Klein, 39 Graham Avenue, Brooklyn, architect, will prepare plans for a four-story automobile service, repair and garage building, 75 x 100 ft., at 224-28 Mulberry Street, New York, to cost \$275,000 with equipment.

S. S. Silver & Co., Inc., 350 Butler Street, Brooklyn, manufacturer of cabinets, etc., has filed plans for an addition to cost about \$18,000.

The L. A. Dreyfus Co., Edgewater, Rosebank, Staten Island, manufacturer of rubber specialties, has awarded a general contract to the Turner Construction Co., New York, for a seven-story addition, 36 x 300 ft., to cost \$200,000. William Higginson, 15 Park Row, New York, is architect.

The Tomkins Cove Stone Co., 30 Church Street, New York, has plans for a new stone crushing plant in the vicinity of Haverstraw, N. Y., to cost more than \$500,000 with machinery.

The Anglo-Chilean Consolidated Nitrate Corporation, an interest of Guggenheim Brothers, 120 Broadway, New York, will build a nitrate plant at Coya Norte, Chile, acquired by the parent organization from the Chilean Government at a cost of \$3,346,500. The ultimate plant will have an output of 520,000 tons, and is expected to cost \$5,500,000. The company also plans the electrification of its railroad in this district. It is disposing of a bond issue of \$16,500,000, a portion of the proceeds to be used for the project. E. A. Cappelen Smith is president.

Morris Whinston, 116 West Thirty-ninth Street, New York, architect, has plans for enlargements and improvements in the four-story automobile service, repair and garage building 100 x 195 ft., at 429-35 East Twenty-third Street, to cost \$100,000 with equipment.

Fire, Oct. 19, destroyed two buildings at the plant of the Matheson Lead Co., Vernon Avenue, Long Island City, with loss reported at close to \$250,000 including equipment. Plans for rebuilding are under advisement.

Angelo Pinto, operating a machine shop at 2940-46 West Eighth Street, Brooklyn, has plans for extensions in the present two-story works to cost \$17,000. Thomas W. Golding, 597 Fifth Avenue, New York, is architect.

The Public Service Electric & Gas Co., Terminal Building, Newark, N. J., will build a one-story power plant at 217 West Second Street, Plainfield, N. J., to cost close to \$50,000. The company has secured permission for an additional stock issue of \$10,000,000, a portion of the fund to be used for extensions and improvements.

The Garod Corporation, 124 Adams Street, Newark, man-

The Crane Market

FEW new inquiries for overhead cranes have appeared in the past week and the market for locomotive cranes continues inactive. The lists of overhead cranes for the Anaconda Copper Mining Co. and Andes Copper Mining Co., New York, are expected to close shortly, four for export to Chile having been bought in the past week. An addition to the numerous gantry cranes now pending comes from Thomas E. Murray, 55 Duane Street, New York, in the market for a stationary gantry to handle a 5-cu. yd. bucket at the Hell Gate station of the United Electric Light & Power Co., New York. The Vermont Marble Co., Proctor, Vt., is inquiring for a 2-ton, 2-motor, single I-beam crane.

In the Pittsburgh district the Carnegie Steel Co. is expected to close shortly for six 3-magnet beam handling cranes for the Homestead works. The Superior Steel Corporation, Pittsburgh, is inquiring for a 25-ton 45-ft. span crane, new or used. The Standard Seamless Tube Co., Economy, Pa., will close shortly on a 20-ton crane.

Among recent purchases are:

Dwight P. Robinson & Co., New York, 23 jib cranes; twelve 1½-ton, one 3-ton, two 2-ton, two 1-ton and two ½-ton and four 10-ton, and one pillar crane from the Whiting Corporation and 19 chain blocks for the jib cranes from the Chisholm & Moore Mfg. Co., air operated hoists for the four 10-ton cranes being on hand.

The Pennsylvania Railroad, a 25-ton gantry crane for Harrison, N. J., from the Whiting Corporation.

Seaboard Air Line, a 150-ton locomotive hoist from the Whiting Corporation.

West Virginia Pulp & Paper Co., 200 Fifth Avenue, New York, two 4-ton trolleys and two 4-ton chain blocks from an unnamed builder.

Oil City Boiler Works, Oil City, Pa., a 5-ton, 58-ft. span, 3-motor overhead crane from the Niles-Bement-Pond Co.

Lancaster Iron Works, Lancaster, Pa., a 15-ton, 58-ft. span crane from the Niles-Bement-Pond Co.

McClellan & Junkersfeld, 68 Trinity Place, New York, a 50-ton, 25-ft. span, 4-motor overhead, an 80-ft. span, 3-cu.

yd. bucket crane and two 5-ton hand power cranes for the Acme Cement Corporation, Catskill, N. Y., from the Whiting Corporation.

Sears, Roebuck & Co., Chicago, two 10-ton, 76-ft. 4-in. span, 3-motor, lumber handling cranes for Newark, N. J., from the Milwaukee Electric Crane & Mfg. Co.

Clarence C. Hahn, Springfield, Ill., a 3-ton, 13-ft. 11-in. span, single I-beam hand power crane from H. D. Conkey & Co.

Oxweld Railway Service Co., 80 East Jackson Boulevard, Chicago, one 1-ton and three 2-ton single I-beam hand power cranes from H. D. Conkey & Co.

Ostrander & Seymore Co., 7 South Dearborn Street, Chicago, three 3-ton, 26-ft. span, single I-beam hand power cranes from H. D. Conkey & Co.

Frank D. Chase, Inc., Chicago, ten 1½-ton jib cranes and nine 1½-ton electric hoists for the Bessemer Gas Engine Co., Grove City, Pa.

Royal Steel Co., Chicago, a 2-ton, 17-ft. span, hand power crane from H. D. Conkey & Co.

Manton & Smith Co., Chicago, a 1½-ton jib crane from H. D. Conkey & Co.

Union Drawn Steel Co., Beaver Falls, Pa., two 10-ton electric cranes for its Massillon, Ohio, and Hartford, Conn., works from Manning, Maxwell & Moore, Shaw Electric Crane Co.

Pittsburgh Steel Co., a 10-ton, 55-ft. 11-in. span overhead crane from the Cleveland Crane & Engineering Co.

Westinghouse Electric & Mfg. Co., a 5-ton, 54-ft. span crane for its Cleveland plant from the Cleveland Crane & Engineering Co.

Aluminum Co. of America, Pittsburgh, six 15-ton, eight 5-ton and two 10-ton cranes from the Dominion Bridge Co., Ltd., and one 20-ton and one 75-ton crane from the Northern Crane Works, Ltd., all for its new plant at Chute à Caron, Quebec.

ufacturer of radio equipment, has acquired the buildings occupied by the Eck-Dynamo Co., Belleville, N. J. and will remodel for a new plant.

A machine shop and welding works will be installed in the new service, repair and sales building of the Red Motor Car Co., 520 Broad Street, Newark, now in course of erection. It will be two-stories and cost \$100,000 with equipment.

The Standard Oil Co. of New Jersey, 26 Broadway, New York, has awarded a general contract to the Turner Construction Co., 244 Madison Avenue, for a two-story addition to its refinery at Constable Hook, Bayonne, N. J., 43 x 160 ft., to cost \$75,000.

Philadelphia

PHILADELPHIA, Oct. 26.

CONTRACT has been let by the Heintz Mfg. Co., Front Street and Olney Avenue, Philadelphia, manufacturer of steel automobile bodies, to Barclay White & Co., local for a three-story addition, 70 x 200 ft., to cost \$80,000.

The Board of Education, Philadelphia, plans the installation of manual training equipment in a proposed three-story and basement junior high school, 225 x 500 ft., at Media and Fifty-third Streets to cost \$750,000, for which bids will be asked on a general contract in November. Plans are also in progress for a four-story junior high school, with manual training department, at Twenty-sixth and Sergeant Streets, to cost close to \$900,000. Irwin T. Catherine is architect.

The Turner Machine Co., 3632 North Lawrence Street, Philadelphia, has awarded a general contract to John G. Fotheringham, 1000 Arrott Street, for a one-story machine shop to cost \$19,000.

Conveying machinery, power and other equipment will be installed in the addition now in course of erection at the plant of the Tasty Baking Co., Twenty-eighth Street and Hunting Park Avenue, Philadelphia, to cost \$200,000.

The Ford Motor Co., Detroit, is asking bids on a general contract for its proposed plant at Chester, Pa., consisting of a one-story assembly building, 455 x 850 ft., one-story fabricating works, 200 x 425 ft.; and power house. Albert Kahn, Marquette Building, Detroit, is architect and engineer.

The Acme Staple Co., Haddon Avenue, Camden, N. J., manufacturer of wire staples and stapling machines, has plans for a two-story and basement addition, 90 x 145 ft., to cost \$65,000. Clarence E. Wunder, 1520 Locust Street, Philadelphia, is architect.

The Central Railroad of New Jersey, 143 Liberty Street, New York, has filed plans for its proposed car and locomotive repair shops at Bethlehem, Pa., to cost \$2,450,000 with machinery.

John T. Olmsted, referee in bankruptcy for the Harrisburg Foundry & Machine Co., Harrisburg, Pa., will sell the plant and assets of the company on Nov. 9. This will be the third attempt to dispose of the property, former bids being below the minimum sum to be considered.

Newton Flounders, Allison Building, Media, Pa., architect, has plans for a one-story power house in connection with a proposed mechanical laundry to cost \$45,000.

The Reading Knob Works, Inc., Reading, Pa., manufacturer of builders' hardware, has begun the construction of an addition to cost \$50,000. It recently acquired the plant and business of the Huber Mfg. Co., 417 East Ninety-third Street, New York, manufacturer of kindred products, and will remove the business to the Reading plant in the spring.

The Harrisburg Light & Power Co., Harrisburg, Pa., will issue stock for \$98,950, a portion of the fund to be used for extensions and improvements.

The Gates Foundry Co., 71 Parrish Street, Wilkes-Barre, Pa., manufacturer of iron castings, has awarded a general contract to A. M. Hildebrand, 91 Wood Street, for a one-story addition, 54 x 100 ft., to cost \$40,000. Thomas Podmore, Bennett Building, is architect.

The Reading Railway Co., Philadelphia, has revised plans for a two-story and basement storage and distributing plant, 68 x 130 ft., at Pottstown, Pa., to cost \$100,000 with material-handling equipment.

South Atlantic States

BALTIMORE, Oct. 26.

PLANS are being completed by the Intercean Oil Co., Curtis Bay, Baltimore, for four additional units at its local refinery, to cost \$300,000 with equipment. The company has recently acquired the Lorraine Petroleum Co., and the

Livingston Petroleum Co., and will consolidate with its organization. Holden A. Evans is president.

The American Supply Co., 213 North East Street, Baltimore, will begin the construction of a one-story plant, 80 x 100 ft., for the manufacture of concrete blocks and other cast cement specialties, to cost \$30,000 with equipment.

The Summers Fertilizer Co., Inc., Stock Exchange Building, Baltimore, is completing plans for rebuilding the portion of its plant, recently destroyed by fire, to be 205 x 240 ft. The installation will include two 80 ft. bridge cranes and other handling machinery. The work will cost approximately \$200,000.

The J. L. Witz Furniture Corporation, Waynesboro, Va., will proceed with the construction of a new plant at Staunton, Va., 160 x 700 ft., with electric power plant, 43 x 90 ft., estimated to cost \$250,000. The company is in the market for wood-working machinery and other equipment. Lockwood, Greene & Co., Atlanta, Ga., are architects and engineers.

The Athens Railway & Electric Co., Athens, Ga., is planning to rebuild the portion of its Tallassee Shoals power plant destroyed by fire Oct. 21, with loss estimated at \$45,000 including equipment.

W. H. Coe, York, S. C., and associates, are considering plans for a new factory at Sharon, S. C., for the manufacture of turned wood products, to cost \$30,000 with equipment.

The Mullins Lumber Co., Mullins, S. C., has inquiries out for an electric traveling crane, with lifting capacity of about 10 tons, 30 to 60 ft. span, to operate at a speed of 300 ft. per min.

The City Council, Shelby, N. C., is considering the installation of pumping equipment in connection with proposed extensions and improvements in the municipal waterworks, to cost \$200,000.

William F. Cecil, Leonardtown, Md., has secured permission to equip and operate a local electric light and power plant.

Northrup & O'Brien, Starbuck Building, Winston-Salem, N. C., architects, will erect a three-story automobile service, repair and garage building, 85 x 197 ft., to cost \$100,000 with equipment.

The Hackley Morrison Co., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for an open bottom drag bucket, about $\frac{1}{4}$ -yd. capacity; one air compressor and shingle mill equipment.

The Scandinavia Belting Co., Beech and Clay Streets, Paterson, N. J., has plans for a new factory for the manufacture of transmission belting, brake lining, etc., at Charlotte, N. C., to cost \$80,000 with equipment. Lockwood, Greene & Co., Atlanta, Ga., are architects and engineers.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, is arranging for a common stock issue to total \$4,000,000, a portion of the fund to be used for extensions and improvements in plants and system. It is arranging an expansion program to cost from \$9,000,000 to \$10,000,000. Herbert A. Wagner is president.

The General Baking Co., 342 Madison Avenue, New York, will begin the construction of a new two-story and basement plant, 240 x 263 ft., at Harford and North Avenues, Baltimore, to include the installation of ovens, conveying machinery, power and other equipment. It will cost about \$500,000 with machinery.

The Board of Commissioners, West Hickory, N. C., is asking bids until Nov. 17 for one 250,000-gal. capacity steel standpipe, or steel tank and tower, in connection with a municipal waterworks. The Carolina Engineering Co., Johnston Building, Charlotte, N. C., is engineer.

Buffalo

BUFFALO, Oct. 26.

CONTRACT has been let by the Wurlitzer Mfg. Co., Falls Boulevard, North Tonawanda, N. Y., manufacturer of pianos and musical instruments, to the L. A. Harding Construction Corporation, Buffalo, for a three and one-story addition, 60 x 140 ft. and 18 x 100 ft., to cost about \$175,000. C. N. Deverill is in charge.

The Western New York Water Co., Electric Building, Buffalo, is disposing of a bond issue of \$2,000,000, a portion of the fund to be used for extensions and improvements in pumping plants and system, including a new filtration plant and other machinery. F. S. McGraw is president.

Faul & Timmins, 149 Oak Street, Buffalo, manufacturers of power plant specialties, have plans for a second story addition to their factory.

The Eastman Kodak Co., 343 State Street, Rochester, has awarded a general contract to the Ridge Construction

Co., local, for a three-story addition, 120 x 190 ft., at Kodak Park, to cost about \$110,000 with equipment.

The Rochester Gas & Electric Corporation, Rochester, is disposing of a preferred stock issue to total \$2,681,200, a portion of the proceeds to be used for extensions and improvements.

The Oswego Falls Corporation, Fulton, N. Y., manufacturer of metal containers, etc., has awarded a general contract to the H. K. Ferguson Co., Cleveland, for a one and two-story plant at Skaneateles, N. Y., 65 x 240 ft., and 35 x 80 ft. respectively.

The Otsego Laundry Corporation, Oneonta, N. Y., is in the market for extractors, transmission, conveying and power equipment for a new plant, replacing one recently destroyed by fire with a loss of \$100,000.

The Mount Morris Valve Corporation, Mount Morris, N. Y., recently organized by Lawrence Bellinger and associates, has plans for the early construction of a factory to manufacture brass valves and fittings.

The International Spark Plug Co., Upper Hoffman Street, Elmira, N. Y., has plans under way for the installation of additional equipment. Garrett Bacorn is manager.

The Rawstron-Kelly Corporation, 110 Washington Highway, Snyder, N. Y., has been organized with capital stock of \$125,000 to manufacture a rotary motor. It is planned to build or purchase a plant in or near Buffalo, N. Y., during the next year.

H. J. Randall, 59 Hopkins Avenue, Jamestown, N. Y., is in the market for equipment for the manufacture of small fine tools, gages and special machinery.

A cylinder regrinding machine, small lathe and a drill press, electrically operated, will be purchased by Anthony Scanozza, 1143 Bailey Avenue, Buffalo, for a garage and service station under construction.

New England

BOSTON, Oct. 26.

FOLLOWING a period of activity which extended over three weeks, buying of machine tools in New England has tapered off somewhat. The amount of business placed during the three weeks, however, was sufficient to equal that which had been placed in the preceding three or four months. Sales during the past week covered a wide range of equipment, though the total volume was reduced. Lathes, presses and bench tools have been the most active items. While many of the larger New England buyers have apparently covered for their requirements, there is still a fair amount of business pending that may result in orders within the coming few weeks.

O. F. Kress Co., 102 Concord Street, Lawrence, Mass., has awarded contract for an automobile repair shop. Ashton, Huntress & Altar, 477 Essex Street, Lawrence, are the architects.

The Towle Mfg. Co., Newburyport, Mass., silversmith has awarded contract for the erection of an addition. George H. Perkins, 200 Devonshire Street, Boston, is the engineer.

Preliminary plans are in progress for a proposed \$75,000 power house at Lewiston, Me., to be erected by the Central Maine Power Co., Augusta. J. C. & J. H. Stevens, 187 Middle Street, Portland, Me., are the engineers.

The American Tissue Paper Co., South Hadley, Mass., B. S. Perkins, manager, has awarded contract for a one-story, 52 x 105 ft. addition for which motors and other equipment are required. Hawes & Howes, 199 High Street, Holyoke, Mass., are the architects.

The Remington Typewriter Co., Railroad Avenue, Bridgeport, Conn., has awarded contract for a five-story, 42 x 60 ft. addition for the manufacture of ribbon and typewriter paper, to cost \$100,000.

The Air Reduction Co., 342 Madison Avenue, New York, manufacturer of acetylene welding apparatus, etc., has plans for new works at 880 Columbia Road, Boston, to cost \$87,000.

The Watson, Frye Co., Bath, Me., manufacturer of paper mill machinery, is planning for the removal of equipment at the plant of the Union Iron Works, Bangor, Me., recently acquired, to its local factory, which will be expanded to accommodate the increase. The acquisition includes, also, all patterns, patents, etc., relating to paper mill machinery heretofore produced by the Union company.

The Never-Oil Bearing Co., Foundry Street, Wakefield, Mass., has awarded a contract to W. T. Powers, 24 Union

Square, Somerville, Mass., for a one-story addition, including power house.

The Remington-Burnelli Aircraft Corporation, 25 West Forty-fifth Street, New York, manufacturer of commercial airplanes, is said to be considering the construction of a new plant in the vicinity of Hartford, Conn., near the Brainerd Field. Temporary works will likely be located at 1638 Broad Street, Hartford, pending the completion of the plant, comprising property owned by Thomas F. Garvan, Hartford, head of the Minerva Motors Co. of America, who has recently acquired a controlling interest in the organization. Mr. Garvan will act as president and treasurer in the future. The company is now operating a plant at the Mitchel Field, Long Island. Vincent Burnelli is vice-president and chief engineer.

A machine shop will be installed in the new one-story armory to be constructed by the 118th Connecticut National Guard, Hartford, Conn., at the Brainerd Field, estimated to cost \$75,000. Payne & Keefe, Manwaring Building, New London, Conn., are architects.

Rolls-Royce of America, Inc., Springfield, Mass., manufacturer of automobiles, has filed plans for a one-story addition to its metal body plant on Waltham Avenue.

The Worcester Paper Box Co., Austin Street, Worcester, Mass., plans the erection of a new two-story plant at Watertown, Mass., aggregating about 75,000 sq. ft. of floor space, to cost \$150,000 with machinery.

The Boston Automobile Supply Co., 96 Bridge Street, Lowell, Mass., has plans for a one-story general distributing plant and machine repair shop, 45 x 210 ft., to cost \$45,000 with equipment.

The Oakes & Dow Co., 311 Atlantic Avenue, Boston, manufacturer of spark plugs, is arranging for plant expansion to develop close to five times the present output. The company is disposing of a preferred stock issue of \$500,000, a portion of the fund to be used for the extension.

The Bridgeport Switch Co., Bridgeport, Conn., has removed its plant from 169 Carroll Avenue to 209 Center Street, with the intention of incorporating for \$50,000 and later adding to its present line of flush wall toggle switches, burglar alarm switches and base battery switches.

Detroit

DETROIT, Oct. 26.

A ONE and two-story foundry will be erected by the Saginaw Products Co., North Hamilton and Monroe Streets, Saginaw, Mich., manufacturer of metal goods, to cost about \$300,000 with equipment. A general building contract has been let to the Austin Co., Cleveland.

The American Brass Goods Co., Grand Rapids, Mich., has begun the construction of a first unit of a new plant to cost \$35,000.

The Board of Trustees, University of Detroit, 630 East Jefferson Street, Detroit, has plans for a new power house at the institution, 48 x 55 ft. Malcolmson & Higginbotham, Detroit, are architects.

The Triangle Tool & Pattern Co., 207 Brady Avenue, Detroit, is asking bids on a general contract for a one and two-story factory, 50 x 100 ft., to cost \$30,000. Janke, Venman & Kreke, 612 Broadway Central Building, are architects.

The Chamber of Commerce, Lansing, Mich., is interested in a proposed local plant for the manufacture of patented hydraulic transmission equipment for automobiles, to be produced under the trade name of Bovee, and is co-operating with the company, name temporarily withheld, for a suitable site. Ranson Y. Bovee is head.

The Lakeside Ice & Coal Co., Mount Clemens, Mich., is arranging for an addition to its ice-manufacturing plant and the installation of new machinery.

The Brenkert Light Projection Co., 49 Cortland Avenue, Highland Park, Detroit, manufacturer of lighting apparatus, has awarded a general contract to the Austin Co. for a two-story plant, 70 x 100 ft., to cost about \$50,000 with equipment. Karl Brenkert is secretary and treasurer.

The Detroit City Gas Co., Clifford Street and Bagley Avenue, Detroit, has plans for a three-story automobile service, repair and garage building, 160 x 200 ft., for company motor trucks and cars, to cost \$150,000 with equipment. Weston & Ellington, Stroh Building, are architects.

Plans have been arranged by the Rickenbacker Motor Co., Detroit, for a merger with the Trippensee Closed Body Corporation of the same city. A capital increase is being arranged from \$7,500,000, to \$12,000,000, to finance the consolidation. It is proposed to expand the two organizations and increase the present output. F. J. Trippensee has resigned as president and general manager of the Trippensee company, and will continue to be identified with the Trippensee Sales & Mfg. Co., 2679 East Grand Boulevard, a

company recently organized to manufacture specialties for automobile trucks and motor buses.

The Wolverine Porcelain Enameling Co., Detroit, operated by the Porcelain Enamel & Mfg. Co., Baltimore, is arranging for expansion and will install a new furnace and other equipment, the work to be carried out by the parent organization.

The Reliable Tool & Die Co., 734 Mount Elliott Avenue, Detroit, has awarded a general contract to Bennage & McKinstry, Morgan Building, for a one-story addition to cost \$25,000. George Langtry heads the company.

The Paige-Detroit Motor Car Co., Fort and McKinstry Streets, Detroit, will arrange equipment and production facilities at its plant to double the present output. H. M. Jewett is president.

The Grand Rapids Show Case Co., Grand Rapids, Mich., has awarded a general contract to Paul A. Mastenbrook, Detroit, for a two-story addition, 102 x 125 ft., to cost about \$50,000.

Cleveland

CLEVELAND, Oct. 26.

MACHINE tool business continues good. Although the buying by the automobile industry in Detroit has subsided, that field is still fairly active. Among the Detroit companies which are still buying equipment are the Packard Motor Car Co. and the Chrysler Motor Corporation. The Willys-Overland Co., Toledo, Ohio, purchased two multiple spindle drilling machines during the week and is expected to require considerable equipment in carrying out its expansion program. Sometime ago the Willys-Morrow Mfg. Co., Elmira, N. Y., a subsidiary of the Willys-Overland Co., had under consideration the replacement of its old equipment with new tools. This project has now been revived. According to the reported plans the present equipment of 400 machines will be replaced with new tools. Of the total approximately 200 are automatic screw machines. The Eaton Axle & Spring Co. is still buying equipment for expansion of its axle plant. Makers of turret lathes and automatic screw machines report a very good volume of orders but mostly for one or two machines.

In the railroad field, the Nickel Plate has purchased a 96-in. 600-ton driving wheel press from the Chambersburg Engineering Co. and the New York Central Railroad is inquiring for a tool room grinder.

The Butler Paper Products Co., Toledo, Ohio, has placed a general contract with H. J. Berkebile & Co., 313 Broadway, for a two-story and basement factory, 50 x 100 ft.

The Youngstown Welding Co., Youngstown, has commenced the erection of a one-story and basement factory, 77 x 220 ft., for the manufacture of tanks for motor trucks. W. D. McKay is president.

The Dina Mfg. Co., Toledo, Ohio, has purchased a building site and plans the erection of a \$300,000 plant for the manufacture of automobile equipment. H. G. Buggie is president.

The Allen Filter Co., 25 South St. Clair Street, Toledo, has taken bids for a one-story factory and office building, 70 x 80 ft.

The Morgan Brass Mfg. Co., 2104 Woodland Avenue, Cleveland, has taken bids for a factory, 100 x 200 ft. William McNamara is manager.

The Portage Iron & Wire Co., Akron, Ohio, has awarded contract to the W. P. Construction Co., 718 Second National Bank Building, for a one-story and basement factory addition, 60 x 100 ft. J. A. Bachman is president.

The Fate-Root-Heath Co., Plymouth, Ohio, manufacturer of tractors and clay working machinery, has awarded contract to the Austin Co. for a one-story addition, 60 x 198 ft.

The Akron Tile & Fireplace Co., East Akron, Ohio, is having plans prepared for a one-story factory, 40 x 108 ft., for the manufacture of screens and weather strips. L. I. Long is secretary and general manager.

The India Tire & Rubber Co., Mogadore, Ohio, is having plans prepared for a factory to cost \$40,000.

The Scranton Carriage Works, 2224 Scranton Road, Cleveland, contemplates the erection of an addition, 35 x 80 ft. John T. Hildebrand is president.

The Electrical Mfg. Co., 4149 East Seventy-ninth Street, Cleveland, has awarded contract for a one-story addition, 81 x 108 ft.

The Willys-Overland Co., Toledo, Ohio, has placed a general contract with H. J. Speiker & Co., Nasby Building, for a 54 x 300 ft. addition to its press shop.

Chicago

CHICAGO, Oct. 26.

THE Nash Motors Co. is again in the market for additional machine tools which, it is said, will call for an expenditure of \$100,000. Of this amount, approximately half will be spent for crank shaft lathes and the remainder for grinding machines of various types. The Studebaker Corporation has purchased two 36-in. planers, and has now practically withdrawn from the market because of the adoption of double shift operations instead of following its original plans to add extensively to its production equipment. The A. O. Smith Corporation, Milwaukee, is still in the market for a fair amount of special purpose machinery. This company recently placed a contract for structural steel for an addition to its plant. Local dealers understand that the Youngstown Sheet & Tube Co.'s list for Indiana Harbor, Ind., has been closed through its Youngstown office. The Chicago board of education, after many delays, has closed for a list of 20 items for the Schurz High School. Inquiries which have been put out during the week are for a 15-in. lathe for the city of Chicago; miscellaneous tools for the Bendix Brake Co., South Bend, Ind.; machine tools for the new Palmer House, Chicago, and two 18-in. x 8-ft. and one 18-in. x 14-ft. used lathes for the National Paper Co., Milwaukee.

Activity in this market is well maintained and dealers feel confident that October will show up well both as to actual sales and the number of inquiries. Dealers report that among the most constant buyers are those companies which are closely allied with the building industry.

Some time ago the Rock Island railroad abandoned the idea of the yearly budget method of buying machine tools and announced that in the future purchases would be made as required from month to month. Within recent months, purchases on that basis by the railroad have been very light. The Illinois Central has ordered a 62-in. boring and turning mill from the Niles-Bement-Pond Co. The Bassick Mfg. Co., Chicago, has bought two 13-in. geared-head lathes. The American Hoist & Derrick Co., St. Paul, Minn., bought a 26 x 20-in. x 6-ft. tool room planer.

The Chicago, Burlington & Quincy Railroad Co., 547 West Jackson Boulevard, Chicago, Ill., will soon break ground for a new two-story cold storage and refrigerating plant at Barstow, Ill.

The Olive Can Co., 450 North Leavitt Street, Chicago, Ill., will build a one-story addition, 51 x 55 ft., to its factory. A. E. Strobel, 110 South Dearborn Street, is architect.

W. J. Nagel, 258 Root Street, Chicago, Ill., will build a one-story brick machine shop, 34 x 105 ft. W. A. Nicholson, 6437 Harvard Avenue, is architect.

The Tarrant Foundry Co., 873 West Grand Avenue, Chicago, Ill., has purchased and on Nov. 1 will assume control of the Cummings Foundry Co., 1338 Courtland Street, Chicago, Ill. The newly acquired property consists of a gray iron foundry and a pattern shop.

The Link-Belt Co., 2300 West Pershing Road, Chicago, has awarded a general contract to the H. K. Ferguson Co., Cleveland, for a one-story addition, 120 x 260 ft., to cost \$100,000 with equipment.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until Nov. 11 for additions and alterations in the ash-conveyor system at the naval training station, Great Lakes, Ill., including ash hoppers, conveyors, receiver tank, etc., specification 5164.

The Knife River Coal Mining Co., Beulah, N. D., is considering rebuilding the portion of its tipple and power plant recently destroyed by fire, with loss approximating \$100,000 including equipment.

The International Harvester Co., 606 South Michigan Avenue, Chicago, is reported to be contemplating the construction of a new plant at Dubuque, Iowa.

The Northwestern Collapsible Carrier Co., 283 Snelling Avenue, South, St. Paul, Minn., has awarded a general contract to the Alexander A. Nelson Co., 3941 Aldrich Avenue, Minneapolis, Minn., for a two-story addition, 40 x 100

ft., to cost \$30,000. The P. E. Crosier Co., New York Life Building, Minneapolis, is architect.

Fire Oct. 16 destroyed a portion of the foundry and pattern shop of the Martin Mfg. Co. Oak Hill St. Louis Park, Minneapolis, Minn., with loss of \$20,000 including equipment. It is planned to rebuild.

The Great Western Sugar Co., Sugar Building, Denver, Colo., is completing plans for a new beet sugar refining works at Minatare, Neb., with main two-story and basement mill, power house, machine shop and other buildings to cost about \$1,200,000.

The Illinois Nail Co., 826 Dix Street, Chicago, will soon take bids for a one and two-story building, 100 x 160 ft., to cost \$60,000. Paul Gerhardt, 64 West Randolph Street, is architect.

The United Light & Power Co., Lincoln, Neb., operating the Lincoln Gas & Electric Co., has acquired the plants and properties of the Blue River Power Co., Seward, Neb., for about \$1,000,000. Plans are under way for extensions and improvements, including the installation of additional equipment.

The H. D. Conkey Co., Mendota, Ill., manufacturer of cranes, trolleys and other conveying equipment, has awarded a general contract to the Austin Co., Chicago, for a one-story addition, 90 x 140 ft., to cost \$50,000.

Milwaukee

MILWAUKEE, Oct. 26.

MORE buyers are appearing in the machine tool market and while individual purchases seldom call for more than two or three items, the volume makes up a relatively satisfactory aggregate. For several months the bulk of sales has been among comparatively few buyers and the fact that demand is now spreading is viewed with much satisfaction. It already is apparent that October sales will compare favorably with those for any month this year. Inquiry is also increasing.

Arthur J. Straus, 230 Grand Avenue, Milwaukee, has engaged Rosman & Wierdsma, architects, 490 Broadway, local, to design a three-story automotive distribution and service building, 110 x 131 ft., at the corner of Jackson and Oneida Streets, to cost about \$250,000. The general contract probably will be let to Robert L. Reisinger & Co., 484 Oakland Avenue, Milwaukee. For the present the name of the tenant, who will purchase the equipment is withheld.

The Trane Co., Second and Cameron Street, LaCrosse, Wis., manufacturer of appliances, devices and materials for the steamfitter and plumbing trades, will invest about \$45,000 in an addition, 78 x 115 ft., to its factory. Merman & Skogstad, local architects, have let the general contract to Peter Nelson & Co. Reuben F. Trane is general manager.

The L. J. Mueller Furnace Co., 197 Reed Street, Milwaukee, plans immediate reconstruction of the damaged portions of its japanning building which was wrecked by an explosion on Oct. 21. The ovens, electrically operated, were damaged beyond repair and will be replaced. The loss is estimated at \$25,000. L. J. Mueller III is works manager.

The Badger Specialty Mfg. Co., Milwaukee, has been organized with \$10,000 initial capital by Henry F. Vollmer, 1197 Twenty-ninth Street, to manufacture metal specialties. Manufacturing space will be leased at once. Lee R. Whitney and Fred J. Guetschow are associated with Mr. Vollmer.

Fred R. Bigler, 14 East Center Street, Chippewa Falls, Wis., operating the Chippewa Valley Auto Co., and conducting the F. R. Bigler Mfg. Co., automotive accessories, trunks, etc., will build an additional story, 100 x 150 ft., to his factory, garage and service building at a cost of \$45,000.

The Aluminum Specialty Mfg. Co., Manitowoc, Wis., has broken ground for a two-story addition, 80 x 120 ft., to its main factory, to cost \$50,000. The general contractor is the Schuette Construction Co., local. Walter E. Spindler is president and general manager.

The Hudson Mfg. Co., Minneapolis, Minn., manufacturer of farm machinery and equipment, barn fixtures, etc., may not rebuild its branch factory at DePere, Wis., which recently was damaged to the extent of \$60,000 by fire and requires almost complete replacement. The Hudson company has acquired control of the C. A. Libbey Co., Oshkosh, Wis., engaged in a competitive line, and will continue its operation under the management of C. A. Libbey, thus providing the equivalent of the capacity lost at DePere. Factories also are maintained at Minneapolis and Hastings, Minn. H. D. Hudson is president and general manager.

The Wisconsin Gas & Electric Co., Public Service Building, Milwaukee, let the general contract to the George Linderman Co., 237 Lake Street, Kenosha, Wis., for the construction of a \$125,000 garage, service building and warehouse to serve the Kenosha district. It will be 100 x 125 ft., part two stories and basement, and contain a service and repair shop, 60 x 100 ft. H. M. Pauly is general manager Kenosha district.

The L. F. Diddie Co., Marshfield, Wis., manufacturer of lightning rods, will build a \$30,000 addition to the factory at 332 West Bakerville Street. The general contract has been let to Frank Fellhoefer, local engineer. L. F. Diddie is president and general manager.

Cincinnati

CINCINNATI, Oct. 26.

AUTOMOBILE makers resumed buying of machine tools on an extensive scale the past week, with the result that several large orders were placed with local builders. With one exception, every prominent manufacturer in the Detroit district made purchases in this market. While railroads are confining expenditures to single machines, inquiries indicate better business from this source in the near future. Production of tools is so heavy that it necessitates the employment of more men than at any time since 1920 in many local plants. One builder states that he has \$600,000 worth of machines in process of construction. A number of manufacturers are unable to make as prompt deliveries as a few months ago, due to the accumulation of orders the past month. Inquiries are numerous and several local builders have quotations out on more than \$125,000 worth of business.

The sale of 11 lathes to the Chrysler Motor Corporation was the outstanding feature of the week. Nine multi-cut lathes are for Detroit delivery and two automatic machines for the company's Newcastle, Ind., plant. Closely following this order in importance, was the purchase of four crankshaft lathes and six multi-cut lathes by the Nash Motors Co. for its Milwaukee works. The Buick Motor Co. bought several production lathes and other automobile manufacturers placed small orders. The Delco Light Co., Dayton, Ohio, purchased six automatic lathes, for its new plant.

The Texas & Pacific Railway Co. bought a 5-ft. radial drill from the Niles-Bement-Pond Co. The latter also booked a 90-in. locomotive axle journal turning lathe for the Nickel Plate railroad and a 36-in. triple-gear engine lathe for D. S. Perkins & Sons, Holyoke, Mass. A local builder sold a large boring mill to a Pacific Coast company. The Niles-Bement-Pond Co. disposed of a 62-in. heavy boring mill to the Illinois Steel Co. and a similar machine to the Black & Clawson Co., Hamilton, Ohio. Orders have been received for an all-steel press brake from Kansas and for two press brakes from Baltimore. A local turret lathe manufacturer sold two machines to companies in the oil fields and booked several lathes for steel plants. Shaper builders report that sales continue satisfactory, while planer manufacturers are figuring on considerable pending business.

The Springfield Gas Co., Springfield, Ohio, is said to be contemplating the erection of a two-story building for repair work.

Contract for a five-story addition to the plant of the F. E. Myers & Bro. Co., Ashland, Ohio, manufacturer of pumps, hay tools, etc., has been awarded to George Kratt & Sons, Lorain, Ohio, Lockwood, Greene & Co., of Cleveland being the engineers. The building will be 68 x 176 ft. and of reinforced concrete.

The France Stone Co., Dixie Highway, Monroe, Ohio, manufacturer of crushed stone products, contemplates rebuilding its plant and power house destroyed by fire, Oct. 19, with loss of \$350,000.

The Randle Machinery Co., 1723 Powers Street, Cummins, Cincinnati, is in the market for a 750 to 1000-kva. generator, 60-cycle, 2300 volts, direct-connected to cross-compound condensing engine, Corliss type.

The Pharis Tire & Rubber Co., 765 West Main Street, Newark, Ohio, has plans for a two-story and basement addition, 80 x 105 ft., to cost \$70,000. A. R. Lindorf is president.

David Dermon, 398 Madison Street, Memphis, Tenn., and associates have preliminary plans for a six-story automobile service, repair and garage building, 148 x 148 ft., to cost approximately \$400,000 with equipment.

The Board of Public Works, Nashville, Tenn., plans the installation of pumping machinery, filtration equipment, power apparatus, etc., in connection with extensions and improvements in the municipal waterworks, to cost \$3,000,000. The J. N. Chester Engineers, Union Bank Building, Pittsburgh, are engineers.

The L. J. Breed Equipment Co., 824 James Building, Chattanooga, Tenn., machinery dealer, has inquiries out for a steam shovel, Bucyrus type.

Gulf States

BIRMINGHAM, Oct. 26.

THE Atlas Portland Cement Co., Leeds, Ala., is said to be contemplating the construction of a new unit at its local mill. Headquarters are at Northampton, Pa.

The Kingsville Ice Co., Kingsville, Tex., is arranging for a one-story ice-manufacturing and cold storage plant to cost \$55,000. S. M. Udden, 1020 Frost Bank Building, San Antonio, Tex., heads the company.

The Marble Falls Textile Mills Co., Marble Falls, Tex., recently organized, is planning for the early construction of a hydroelectric power plant at its proposed local cotton mills. It will cost about \$150,000. George H. Carter, Marlin, is one of the heads of the company.

E. F. Lane, secretary, Chamber of Commerce, Key Largo, Fla., has inquiries out for a steam shovel.

The Builberson Co., 1025 Pennsylvania Street, Dallas, Tex., manufacturer of oil well equipment, has filed plans for a one-story addition to cost \$23,000.

The American Body Co., 5113 East Grand Street, Shreveport, La., is said to be arranging for the construction of a new plant to manufacture bodies for commercial trucks.

The Peoples' Cotton Oil Co., Lafayette, La., has purchased property, 100 x 325 ft., and has tentative plans for a one-story ice-manufacturing plant to cost about \$30,000 with equipment.

Officials of the General American Tank Car Corporation, Harris Trust Building, Chicago, have formed the General American Tank Storage & Terminal Co., with headquarters at New Orleans, where the initial plant has been located. The company purposed to construct and operate storage and distributing terminals for handling liquids in connection with the general tank car service of the parent organization.

David K. Stabler, superintendent of park development, Tampa, Fla., is planning to purchase a hydraulic ram for use in connection with a proposed irrigation system.

The Continental Gas, Light & Power Co., Fort Worth, Tex., is planning the installation of a steam-operated electric power house at Megargel, Tex., expanding the local station, recently acquired. It is also considering the erection of a one-story ice-manufacturing plant.

The Board of School Trustees, Tampa, Fla., is considering the construction of shop additions for manual training at the Memorial and Wilson junior high schools, to cost \$90,000.

The Lamb-Gary Mfg. Co., P. O. Box 675, Vicksburg, Miss., will proceed with the construction of a hardwood floor manufacturing plant, with department for corrugated metal roofing and kindred specialties, consisting of a main unit, 75 x 250 ft., with extension, 50 x 200 ft. A one-story power plant will be built, 36 x 72 ft. The entire works will cost about \$125,000. The company is in the market for certain equipment, including a 500-kw. direct-connected generator set, motors from 5 to 75 hp., and other apparatus.

The Common Council, Brooksville, Fla., plans the installation of pumping machinery with capacity of about 80,000 gal. daily, in connection with a proposed municipal waterworks, estimated to cost \$750,000. F. S. Parrigan is engineer, in charge.

The Valley Electric & Ice Co., San Benito, Tex., plans enlargements and improvements in the power plant of the La Feria Light & Ice Co., La Feria, Tex., with the installation of additional machinery.

The Harkrider-Keith-Cooke Co., 1801-9 Jones Street, Fort Worth, Tex., is arranging to rebuild the portion of its cold storage and refrigerating plant destroyed by fire Oct. 18, with loss reported at close to \$100,000.

The Tampa Electric Co., Tampa, Fla., will soon begin the construction of an addition to its steam-operated electric power plant, to include the installation of watertube boilers, oil-burning equipment and other apparatus. Stone & Webster, Inc., 147 Milk Street, Boston, is engineer.

The Smith-Thomas Lumber Co., Phenix City, Ala., has plans for a new lumber mill to cost \$90,000 with machinery.

Work will begin early next coming year. H. Dixon Smith is secretary.

Addison Mizner, head of the Mizner Development Co., Boca Raton, Fla., and associates are considering plans for a one-story ice-manufacturing and cold storage plant, to cost \$75,000 with equipment.

The Decatur Iron & Steel Co., Albany, Ala., has inquiries out for a 48-in. gate shear, to handle stock up to $\frac{3}{4}$ -in.

The University of Texas, Austin, Tex., has plans for a new power house to cost approximately \$200,000. Dr. W. J. Battle is chairman of the building committee.

Indiana

INDIANAPOLIS, Oct. 26.

CONTRACT has been awarded by the Studebaker Corporation, South Bend, Ind., to the Ralph Sollitt Construction Co., local, for a four-story and basement addition, 180 x 460 ft., for the manufacture of automobile springs and other equipment, to cost approximately \$1,000,000 with machinery. A 10-ton traveling crane will be installed. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer.

The Indianapolis Lamp Co., Nineteenth Street and Western Avenue, Connersville, Ind., manufacturer of automobile lamps, has plans under advisement for an addition. Ford, Bacon & Davis, Inc., 115 Broadway, New York, is engineer.

The Bendix Brake Co., 401 North Anthony Street, Hammond, Ind., manufacturer of automobile brakes, will soon begin work on the second and third units at its local plant to cost \$100,000, for which a general contract has been let to the H. G. Christman Co., Hammond.

The Interstate Public Service Co., Vincennes, Ind., will make extensions and improvements in its power plant at Edwardsport, Ind., to cost more than \$150,000 including equipment. It will also make extensions and betterments in the Vincennes district to cost \$50,000.

C. E. Sterling, 306 Pennway Building, Indianapolis, has formed the C. E. Sterling Co., to manufacture water-softening equipment and parts. Property has been leased at 2162 North Meridian Street for the initial plant, and operations will soon begin.

The Building Brick Co. of Illinois, Brazil, Ind., G. E. Luce, general manager, will soon begin the construction of a new plant at Sundown, Ind., to cost \$300,000 with machinery.

The plant of the Emerson-Brantingham Co., Columbus, Ind., manufacturer of farming implements and equipment, has been acquired at a public sale by C. Russell Feldman and associates for \$115,000. The plant has been idle for several years. The new owner proposes to dispose of the machinery and equipment. The selling company, now concentrating production at its main works at Rockford, Ill., has leased one of the buildings at the Columbus plant, for service and parts production for Reeves engines and implements formerly manufactured here. The same purchaser has also acquired the Emerson-Brantingham plant at Waynesboro, Pa., and will dispose of the machinery.

Joseph and William Dalton, 1000 Madison Street, Gary, Ind., coal dealers, have plans for a one-story coal storage and handling plant, 100 x 400 ft., with one-story automobile service, repair and garage building for company motor trucks, to cost \$90,000 with equipment.

The Board of School Trustees, Evansville, Ind., plans the installation of manual training equipment in its proposed two-story and basement junior high school, to cost \$400,000. J. C. Llewellyn, 38 South Dearborn Street, Chicago, is architect.

St. Louis

ST. LOUIS, Oct. 26.

WORK will begin on a two and three-story addition to the plant of the Campbell Baking Co., 3219 Troost Street, Kansas City, Mo., 150 x 190 ft., to include the installation of ovens, power equipment, conveying and other machinery, to cost \$450,000. Mills, Rhines, Bellman & Nordhoff, Ohio Building, Toledo, Ohio, are architects.

D. H. Kendall, Buffalo, Okla., is arranging to rebuild the local ice-manufacturing plant, recently acquired, with the installation of equipment to cost about \$25,000. An engine and generator for light and power service will be included.

The Columbian Steel Tank Co., Kansas City, Mo., is pushing construction of its first three-story and basement plant unit at 1609 West Twelfth Street, 130 x 255 ft. It

will cost close to \$500,000 with machinery. Other units will be built later. A. A. Kramer is president.

The Crusader Oil Co., Schuler Building, El Dorado, Ark., is said to be planning the construction of a pipe line from the Smackover Field to Vidalia, Ark., to cost more than \$150,000.

The William Wurdack Electric Mfg. Co., 21 South Eleventh Street, St. Louis, has acquired property on Clayton Avenue, and is reported to be planning the construction of a new factory.

N. F. Farha, 615 West Douglas Street, Wichita, Kan., is considering the erection of a one-story and basement ice-manufacturing plant, 50 x 120 ft., to cost \$30,000.

The Ark-Mo Cotton Co., Inc., Harviell, Mo., is in the market for a number of force pumps, with capacity of 250 to 500 gal. per hr.

The Missouri Pacific Railroad Co., St. Louis, is said to have authorized an appropriation of \$146,000 for the equipment of a new reclamation plant at its repair shops at Sedalia, Mo. E. A. Hadley is chief engineer.

The Chicago Mill & Lumber Co., 111 west Washington Street, Chicago, will rebuild the portion of its mill and power plant at Blytheville, Ark., recently destroyed by fire with loss of \$400,000. The new units will be of like capacity, completely equipped with new machinery. Fred W. Schatz is local manager.

The Missouri Hydro-Electric Power Co., Bagnell, Mo., will proceed with the construction of a power dam, 100 ft. high and 2400 ft. long, on the Osage River, near Bagnell, for its proposed hydroelectric generating plant. The station will have an initial capacity of 100,000 hp. The work will include a steel tower transmission line. The project will form a division of a power project to cost about \$30,000,000, for which a new company will be organized under the name of the Super-Power Corporation of Missouri. The Charles B. Hawley Engineering Co., Munsey Building, Washington, is engineer, and will make equipment purchases.

The Pennsylvania Petroleum Co., Fifteenth and Charlotte Streets, North Kansas City, Mo., will construct a new one-story storage and distributing plant, 115 x 175 ft., L-shaped, to cost about \$55,000. Charles A. Smith, Finance Building, is architect.

R. H. Sanneman, 519 Lee Building, Kansas City, Mo., architect, will erect a three-story and basement, L-shaped automobile service, repair and garage building, 85 x 185 ft., and 50 x 56 ft., to cost \$150,000 with equipment.

The All Locking Zinc Shingle Mfg. Co., Owensville, Mo., has been organized to manufacture zinc shingles and kindred products and is preparing to build a plant.

The C. F. Camp Co., 14 East Seventh Street, Tulsa, Okla., has been organized with a capital of \$75,000 to manufacture oil well equipment and supplies, including drilling engines. The company reports that all manufacturing equipment has been secured.

Pittsburgh

PITTSBURGH, Oct. 26.

THIE local machine tool market has taken on a little more life, partly due to increased activity of railroad equipment manufacturers and the outlook for railroad business. The Lorain Steel Co., Johnstown, Pa., has taken bids on three frog and switch planers and the Bethlehem Steel Co. will buy two planers of the same type for its Cambria works, Johnstown. The 1926 tool requirements of shops of the Pennsylvania Railroad, Central Region have been made up, but issuance of formal inquiries is probably some time off. The Youngstown Sheet & Tube Co., has placed 30 tin mill shears for its Indiana Harbor tin plate plant with the Streine Tool & Mfg. Co., New Bremen, Ohio, the shears to be built to the buying company's designs.

Fire, Oct. 18, destroyed a portion of the plant of the Rosedale Foundry Co., Columbus and Preble Avenues, Northside, Pittsburgh, with loss reported in excess of \$65,000 including equipment.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, has awarded a general contract to the B. A. Groah Construction Co., 847 West North Avenue, for a four-story and basement addition to its plant at New Brighton, Pa., 30 x 52 ft. Bernard H. Prach, Martin Building, Pittsburgh, is architect.

The Allegheny River Sand Co., Pittsburgh, will construct a hoisting and handling plant, storage building and ice breakers near Mosgrove, Armstrong County, on the Allegheny river.

The Kelly Axe & Tool Co., Charleston, W. Va., has plans for the installation of three gantry cranes and other hoisting, handling and conveying equipment in connection with a proposed shipping terminal on the Monongahela River.

The Kanawha Specialty Co., Parmaco Street, Parkersburg, W. Va., C. W. Pettigrew, general manager, recently organized, has acquired the plant and business of the Fuel City Mfg. Co., manufacturer of stamped steel products, tools, etc. The new owner will continue the operation of the plant and contemplates expansion.

The Board of Education, Bluefield, W. Va., plans the installation of manual training equipment in a proposed junior high school to cost \$175,000, for which a general contract will be let in November. Garry & Sheffey, First National Bank Building, are architects.

The Bennett Lumber Mfg. Co., Sedgwick Street, Millvale, Pa., is taking bids on a general contract for a one and two-story and basement mill, 50 x 105 ft., to cost \$50,000 with machinery.

The Clinton Iron & Steel Co., West Carson Street, Pittsburgh, will soon begin the construction of a one-story slag-crushing plant, to cost about \$50,000 with machinery.

E. C. and H. E. Hines, P. O. Box 1059, Huntington, W. Va., have plans for a five-story automobile service, repair and garage building, 100 x 185 ft., to cost \$150,000. Meanor & Handloser, Professional Building, are architects.

Evan I. Brown, Pittsburgh, care of the Enterprise Contracting Co., Jackson Street, has applied for permission to construct a coal tipple along the Monongahela River.

The Pittsburgh & Lake Erie Railroad Co., Smithfield and Carson Streets, Pittsburgh, has awarded a general contract to Walker & Curley, 106 Bridge Street, Sharpsburg, Pa., for a one-story lacquer shop, 25 x 58 ft., at McKees Rocks, Pa., to cost \$42,000 with equipment.

Pacific Coast

SAN FRANCISCO, Oct. 21.

CONTRACT has been let by the Crown-Willamette Paper Co., 248 Battery Street, San Francisco, to the Hansen-Hammond Co., Portland, for a two and three-story mill, 83 x 325 ft., at Camas, Wash., for kraft paper production, to cost \$1,000,000 with machinery. A power house and machine shop will be built.

The Sutter Basin Co., Knights Landing, Cal., will build a one-story machine shop in connection with other buildings at Robbins, Sutter Basin district, to cost about \$80,000.

The El Monte Union High School District, El Monte, Cal., is asking bids until Nov. 12 for two-motor driven wood-turning lathes for the manual training department. A. E. Edmonds is in charge.

The City Council, Medford, Ore., plans the installation of pumping machinery and auxiliary equipment in connection with a proposed municipal waterworks to cost \$975,000.

W. L. Eaton & Co., Pine and Summit Streets, Seattle, local representative for Dodge Brothers, Inc., is considering plans for a two-story service, repair and sales building, 176 x 360 ft., to cost about \$150,000 with equipment.

Fire, Oct. 14, destroyed a portion of the plant of the Zellerbach Paper Co., Seattle, manufacturer of paper bags, containers, etc., with loss reported at \$85,000. Plans for rebuilding are under advisement. Headquarters are at Sacramento, Cal.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, Pa., has organized the Sanitary Mfg. Co. of California, to take over the plant of the Pacific Sanitary Mfg. Co., San Francisco, recently acquired. Plans are under way for expansion in the works in the East Bay district reported to cost more than \$2,500,000 with machinery.

The Southern California Edison Co., Los Angeles, is arranging an expansion and improvement program to include the construction of hydro-electric power units, additional steel tower transmission lines, automatic power substations, and miscellaneous work to cost \$32,558,000. The company has applied for permission to issue bonds for \$10,000,000.

The Los Angeles Ice & Cold Storage Co., Los Angeles, will erect a new four-story plant at Seventh and Mesquit Streets, for which bids will soon be asked on a general contract. Hunt & Burns, Laughlin Building, are architects.

The Steel Tank & Pipe Co., 1100 Fourth Street, Berkeley, Cal., has plans for a new four-story works to cost \$45,000.

The Great Western Power Co., 530 Bush Street, San Francisco, has arranged for a bond issue of \$4,000,000, a portion of the fund to be used for extensions in hydroelectric power plants and system.

Plans are being made to purchase additional equipment for the machine shops of the Schumacher Wall Board Corporation of Los Angeles, Fifty-eighth and San Pedro Streets, Los Angeles.

The Western Drop Forge Co., Los Angeles, has installed a 5000-lb. four-roll board Erie drop hammer.

With the completion of a new cupola at the plant of the Kinney Iron Works, Twenty-eighth and Santa Fe Streets, Los Angeles, the capacity of the works for the production of iron and semi-steel castings has been doubled.

Fire of undetermined origin, Oct. 6, caused an estimated loss of \$100,000 to the foundry of the McCormick Brothers Iron Works, Main and Folsom Streets, San Francisco.

Joseph Gerrick & Co., Call Building, San Francisco, have been incorporated by Joseph Gerrick and associates, to engage in structural steel erection on the Pacific Coast, specializing in railroad bridge work. Mr. Gerrick was connected with the firm of Gerrick & Gerrick, Seattle, Wash., for 26 years.

The Pacific Coast Steel Co., San Francisco, has leased 58 acres in the Natavidad district, Monterey County, Cal., on which it will operate a lime stone quarry for the production of dolomite for its open-hearth furnaces.

Canada

TORONTO, Oct. 26.

IMPROVED demand for machine tools continues in this market and both dealers and builders report a better volume of business in practically all classes of machines. Orders for one or two tools to a purchaser predominate. In addition to the local demand, inquiries are also appearing for tools for export.

The Aluminum Co. of Canada recently placed orders for 18 cranes from 10 to 75 tons capacity, for its new plant at Chute-a-Caron, Quebec. These contracts went to Canadian firms.

The B. Greening Wire Co., Hamilton, Ont., has entered into an agreement with the Hoff Metal Products Co., New York, to manufacture and distribute the Hoff automobile chain in Canada and the British Empire. This will not involve the erection of an addition to the plant at Hamilton, but some \$75,000 worth of machinery is being installed in connection with the work.

Plans are being prepared by Pennington & Boyde, Bartlett Block, Windsor, Ont., for the erection of a factory for the L. A. Young Industries, Ltd., McDougall Avenue, Windsor, Ont.

The city of New Glasgow, N. S., has awarded contracts in connection with the erection of an electric power plant. Equipment is still to be purchased.

Preliminary work on a new mill at Fort Francis, Ont., for the Backus-Brooks interests, has been started and will be carried on throughout the winter. W. H. Horton is in charge of the undertaking. It will cost \$1,000,000.

Initial work in connection with the erection of a large newsprint mill and power plant at Chelsea, Que., to cost about \$6,000,000, for the International Paper Co., is expected to start immediately. Provision has been made for the installation of two units to develop 24,000 hp. The proposed mill will have a daily capacity of 400 tons.

La Cie de Veneer de St. Donat, Ltd., St. Donat, Que., proposes to build a factory to cost \$20,000 and is in the market for a steam engine, heating plant, veneer machine for cutting wood, etc.

The Coleman Lamp Co., Queen and Davies Streets, Toronto, is building an addition to its plant. R. G. Kirby, 539 Yonge Street, has the general contract.

Construction is under way on an addition to the Swansca plant of the Steel Co. of Canada, Ltd., Hamilton, Ont.

Ernst Brothers, Mount Forest, Ont., propose to enlarge their machine shop and are interested in equipment.

The Canada Steamship Lines, Ltd., Ottawa, Ont., has plans for the erection of a 7,000,000 bu. capacity grain elevator at Prescott, Ont. A power plant will also be installed.

Western Canada

The Town Council, Coderre, Sask., has entered into an agreement with A. Huel, Gravelbourg, Sask., to supply the town with electric light and power. A power plant will be erected.

The Vancouver Dredging & Salvage Co., North Vancouver, B. C., contemplate erecting a boat building plant to cost \$50,000.

The electrification of the Winnipeg, Man., high pressure water plant at a cost of \$60,000 is under consideration by the City Council. C. J. Brown is city clerk.

Tenders addressed to the chairman of the committee on Public Utilities, Winnipeg, Man., will be received at

the office of C. J. Brown, city clerk, until Nov. 9 for two three-phase generators of 6500 kva. capacity each, and two units of horizontal shaft turbines with governors for the power plant at Point du Bois, Man.

Foreign

THE Secretary of Public Works, Wellington, New Zealand, is asking bids until Dec. 8 for transmission steel supports for the Waikato power scheme, comprising 120 poles, 22 light angle towers, and 28 heavy angle towers.

In connection with plans for the electrification of its line from Caracas to La Guaira, 23 miles, the La Guaira-Caracas Railway Co., La Guaira, Venezuela, plans the construction of a power house in the vicinity of Zig Zag, with Diesel engine-generator sets and accessory equipment. Shops will also be arranged for electric locomotive repairs. The entire project will cost \$750,000. Further information at the office of the Electrical Equipment Division, Bureau of Foreign and Domestic Commerce, Washington, reference No. 183816.

The Shell-Mex Oil Co., Ltd., Havana, Cuba, recently formed with a capital of \$2,000,000 as a subsidiary of the Royal Dutch Shell Oil Co., London, England, has tentative plans for the construction of a crude oil refining and gasoline manufacturing plant to cost \$650,000.

The Norwegian Nitrid Aktieselskap, Odda, Norway, has disposed of a security issue totaling \$2,000,000, and will use the fund for remodeling the local works of the Aktieselskapet Tyssefaldene, recently acquired for the manufacture of aluminum. Complete machinery will be purchased soon. The company has purchased a plant at Duisburg, Germany, for the manufacture of aluminum products.

The Administracion General de las Usinas Electricas del Estado, Montevideo, Uruguay, is asking bids for 96,000 meters of lead-covered copper conductor wire and 26,000 kilos of bare copper wire, as per specification on file at the office of the Electrical Equipment Division, Bureau of Foreign and Domestic Commerce, Washington, references Nos. 184503 and 184501 respectively. (No closing date for bids announced.)

Industrial Notes

H. F. Huncke & Co., 25 South Jefferson Street, Chicago, have been appointed exclusive representatives in the Chicago territory for the standard and special milling cutters manufactured by the Goddard & Goddard Co., Inc., 4724 Hastings Street, Detroit.

The Acme Stamping & Brass Works, Zeeland, Mich., is about to erect a new plant at Holland, Mich., measuring 90 x 126 ft. The company is capitalized at \$50,000 and is engaged in making stampings, forgings and castings, both finished and unfinished, from non-ferrous metals. There is also a plating department. Jacob Elmbass is president.

Kinfolks, Inc., recently incorporated is now occupying a commodious factory in Little Valley, N. Y. At the present time it is making razors and hunting knives. The large stockholders in the organization are also interested in the W. R. Case & Sons Cutlery Co., Bradford, Pa., and the Cattaraugus Cutlery Co., Little Valley, N. Y. The directors are J. B. F. Champlin, Little Valley, and Paul Itner, Little Valley, J. Russell Case and Dean J. Case, Foster Brook, Pa., and Tint Champlin, Little Valley.

Trade Changes

The Penn Electrical & Mfg. Co., Irwin, Pa., manufacturer of switchboards and panel boards, has changed its name to the Penn Electrical Co. Ownership, organization, personnel and products continue the same as heretofore.

The Federal Cement Tile Co., 608 South Dearborn Street, Chicago, with works at Hammond, Ind., has established a branch sales office at Indianapolis, in charge of C. B. Baird, who has been associated with the company for many years.

The Climax Engineering Co., Clinton, Iowa, builder of gasoline engines, has appointed the following representatives and agents in various territories: Coast Machinery Corporation, 829 Folsom Street, San Francisco, for northern California, the company formerly having had the Los Angeles territory only; George W. Whitehead Co., 61 The Terrace, Buffalo, for western New York; Edward C. Dingman, 1005 Keefer Building, Montreal, for the Montreal district; Harvard Turnbull & Co., Ltd., 912 Excelsior Lift Building, Toronto, for the Ontario territory; Advance Contractor Repair Co., 1332 West Lake Street, Chicago, for

the Chicago district; Mine & Smelter Supply Co., 121 West Second Street, Salt Lake City, Utah, for the State of Utah; and McDonald & Burgman, Jacksonville, Fla., a sales and service station.

The Philip Schwab Co., Milwaukee, manufacturer of boilers, general machinery, heavy forgings, etc., has changed its corporate title to Schwab Boiler & Machine Co. At the same time notice of dissolution of the Milwaukee Schwab-Lezotte Boiler Co. has been filed. The plant and offices are at Sixteenth and Canal Streets. Philip Schwab is president and general manager.

Thomas J. Corcoran, president Thomas J. Corcoran Lamp Co., Cincinnati, manufacturer of automobile lamps, has sold his interest to G. P. Doll, secretary and treasurer, and will retire from business.

F. A. Schneider, president and general manager Gartland-Haswell-Rentschler Co., Dayton, Ohio, has acquired ownership of the Kankakee Foundry Co., Kankakee, Ill., gray iron foundry. Mr. Schneider is also the general manager of the McCarthy Foundry Co., Chicago.

The Midwest Steel Co., with plant at Bradford, Pa., will remove its general offices in the Grand Central Terminal Building, New York, to Bradford.

The Shiloh Mfg. Co., Seibold Building, Dayton, Ohio, has moved its plant from Shiloh Springs, Ohio, to 314 East Fifth Street, Dayton. The company manufactures water softeners.

Officials of the Gibbs Metal Container Co., Columbia, Pa., manufacturer of jar and bottle screw caps, have arranged for a change in company name to the Metalcraft Corporation, specializing in sheet metal stampings and products heretofore produced by the former company. At the same time the capital has been increased from \$250,000 to \$500,000, for general expansion, to include the purchase of the plant and business of the Perfection Shade Roller Co., Lancaster, Pa., manufacturer of all-metal shade rollers, which the purchasing company will continue to produce. It is understood that the Lancaster works will be consolidated with the Columbia plant.

Industrial Finance

Victor E. Murray has been appointed receiver of the Reedy Elevator Co., 11-15 West Second Street, Cincinnati, upon the application of Charles Reedy, president. Although the company is solvent, it is unable to convert its assets into money at present because of trade conditions. The company has on hand a large number of manufactured parts of elevators which, it is explained, would be profitable and would be for the benefit of creditors if sold in the usual transaction of business.

The Central Steel Co., Massillon, Ohio, reports earnings of \$1,939,014 for the six months ended June 30 after depreciation but before deduction of Federal taxes. This is equivalent to slightly more than \$6.50 a share for the common stock after allowing for taxes and preferred dividends for the first half of the year.

The annual report of the Crucible Steel Co. of America for the fiscal year ended Aug. 31, 1925, shows a net profit of \$4,525,466 and an addition to surplus after payment of dividends of \$575,527. During the year the company expended \$1,011,415 in new machinery and equipment.

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Current Metal Prices

On Small Lots, Delivered from Stocks, New York

THESE prices are given for the convenience of small-lot buyers whose requirements do not run into mill-size orders.

Only base prices can be listed in some cases, due to limits of space; other items of a given group are deducible from the base price.

The prices which are quoted below are those at which small lots may be bought, whether from jobbers' or other stocks.

Complete market reports and prices on large shipments from mills will be found elsewhere under "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates		Per Lb.
Bars:		
Refined iron bars, base price.....		3.24c.
Swedish charcoal iron bars, base.....	7.00c. to	7.25c.
Soft steel bars, base price.....		3.24c.
Hoops, base price		4.49c.
Bands, base price		3.99c.
Beams and channels, angles and tees, 3 in. x 1/4 in. and larger, base.....		3.34c.
Channels, angles and tees under 3 in. x 1/4 in. base		3.24c.
Steel plates, 1/4 in. and heavier.....		3.34c.

Merchant Steel		Per Lb.
Tire, 1 1/2 x 1/2 in. and larger.....		3.30c.
(Smooth finish, 1 to 2 1/2 x 1/4 in. and larger).....		3.65c.
Toe-calk, 1/2 x 1/8 in. and larger.....		4.20c.
Cold-rolled strip, soft and quarter hard.....		7.00c.
Open-hearth spring steel	4.50c. to	7.00c.
Shafting and Screw Stock:		
Rounds and hex.....		4.00c.
Squares and flats		4.50c.
Standard tool steel, base price.....		15.00c.
Extra tool steel		18.00c.
Special tool steel		23.00c.
High-speed steel, 18 per cent tungsten.....		70c.

Sheets		Per Lb.
Blue Annealed		
No. 10		3.89c.
No. 12		3.94c.
No. 14		3.99c.
No. 16		4.09c.

Box Annealed—Black		Per Lb.
Soft Steel	Blued Stove	
C. R. One Pass	Pipe Sheet	
Per Lb.	Per Lb.	
Nos. 18 to 20.....	3.75c. to 3.95c.	
Nos. 22 and 24.....	4.00c. to 4.20c.	4.35c.
No. 26	4.05c. to 4.25c.	4.40c.
No. 28*	4.15c. to 4.35c.	4.50c.
No. 30	4.35c. to 4.55c.	

Galvanized		Per Lb.
No. 14		4.25c. to 4.45c.
No. 16		4.40c. to 4.60c.
Nos. 18 and 20.....		4.55c. to 4.75c.
Nos. 22 and 24.....		4.70c. to 4.90c.
No. 26		4.75c. to 5.05c.
No. 28*		5.15c. to 5.35c.
No. 30		5.65c. to 5.85c.

No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe		Wrought Iron
Standard Steel	Black Galv.	Black Galv.
1/2 in. Butt....	46 29	1/2 in. Butt.... 4 +19
3/4 in. Butt....	51 37	3/4 in. Butt.... 11 + 9
1-3 in. Butt....	53 39	1-1 1/2 in. Butt 14 + 6
2 1/2-6 in. Lap..	48 35	2-in. Lap.... 5 +14
7 & 8 in. Lap..	44 17	3-6 in. Lap.... 11 + 6
11 & 12 in. Lap.	37 12	7-12 in. Lap.... 3 +16

Bolts and Screws
Machine bolts, cut thread, 40 and 10 per cent off list
Carriage bolts, cut thread, 30 and 10 per cent off list
Coach screws, 40 and 10 per cent off list
Wood screws, flat head iron,
80, 20, 10 and 5 per cent off list

Steel Wire		Per Lb.
Base Price† on No. 9 Gage and Coarser		
Bright, basic		4.10c. to 4.25c.
Annealed, soft		4.35c. to 4.50c.
Galvanized, annealed		5.00c. to 5.15c.
Coppered, basic		5.00c. to 5.15c.
Tinned, soft Bessemer.....		6.00c. to 6.15c.

†Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire		BASE PRICE
High brass sheet .....		.19 1/2c. to 20 1/2c.
High brass wire .....		.19 1/2c. to 20 1/2c.
Brass rods .....		.16 1/2c. to 17 1/2c.
Brass tube, brazed .....		.27 1/2c. to 28 1/2c.
Brass tube, seamless .....		.28 1/2c. to 24 1/2c.
Copper tube, seamless .....		.24 1/2c. to 25 1/2c.

Copper Sheets	
Sheet copper, hot rolled, 21 1/2c. to 22 1/2c. per lb. base.	
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.	

Tin Plates		COKE—14x20	Prime Seconds
Bright Tin	Grade "AAA"	80 lb... \$6.15	\$5.90
	Charcoal	90 lb... 6.30	6.05
	14x20	100 lb... 6.45	6.20
	IC.. \$11.25	8.85	6.65
	IX.. 12.85	10.85	7.85
	IXX.. 14.40	12.55	9.00
	IXXX.. 15.75	13.85	10.35
	IXXXX.. 17.00	15.05	11.35

Terne Plates		8 lb. coating, 14 x 20
100 lb.		\$7.00 to \$8.00
IC		7.25 to 8.25
IX		8.25 to 8.75
Fire-door stock		9.00 to 10.00

Copper	
Lake ingot .....	.16 1/2c.
Electrolytic .....	.16 1/2c.
Casting .....	.16 c.

Spelter and Sheet Zinc	
Western spelter .....	.10 1/2c.
Sheet zinc, No. 9 base, casks.....	.12 1/2c.; open, .13c.

Lead and Solder*	
American pig lead .....	.10 1/2c. to 12 1/2c.
Bar lead .....	.12 1/2c. to 13 1/2c.
Solder, 1/2 and 1/2 guaranteed .....	.40c.
No. 1 solder .....	.37c.
Refined Solder .....	.30 1/2c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal	
Best grade, per lb.	.75c. to 90c.
Commercial grade, per lb.	.35c. to 50c.
Grade D, per lb.	.25c. to 35c.

Antimony	
Asiatic .....	.21c. to 22c.

Aluminum	
No. 1 aluminum (guaranteed over 99 per cent pure), ingots for remelting, per lb...	.30 1/2c. to 31 1/2c.

Old Metals	
The market is strong and inquiry active. Dealers' buying prices are as follows:	

		CENTS PER LB.
Copper, heavy crucible		12.00
Copper, heavy wire		11.75
Copper, light bottoms		9.50
Brass, heavy		7.25
Brass, light		6.00
Heavy machine composition		9.00
No. 1 yellow brass turnings		8.50
No. 1 red brass or composition turnings		8.25
Lead, heavy		7.75
Lead, tea		6.25
Zinc		4.75
Cast aluminum		19.00
Sheet aluminum		19.00

